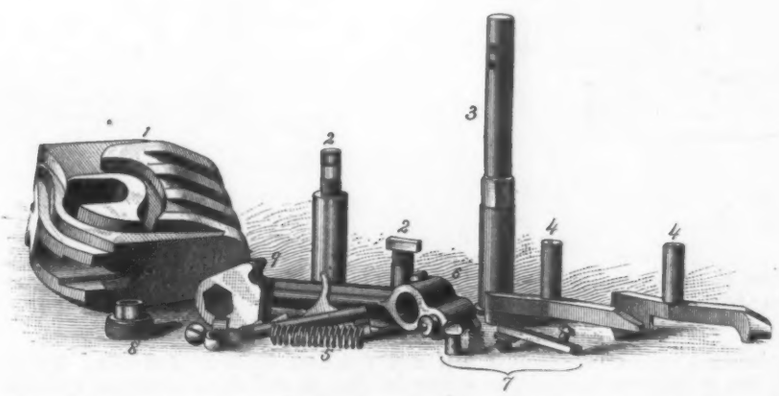
THE IRON AGE

THURSDAY, JANUARY 16, 1890

THE DRIGGS-SCHROEDER SYSTEM OF RAPID-FIRE GUNS.

The flattering success which has attended the official trials of the Driggs-Schroeder rapid-fire gun, of which we herewith present full drawings, has brought it prominently into place where it may be said to rival, and in some features excel, the older and in general better-known guns intended to do the same work. The development of this gun is the fact that it is the only purely American gun of this class now in the market. The Hotchkiss and Maxim guns although both the invention of Americans were not brought out in this country or developed here, and America has no claim upon them except the bare fact that the inventors were citizens of the United States. Although the conception of both of these systems probably originated in this country, they were developed and brought to their present state of perfection in Europe, where they were both given extended trials and more and less freely adopted by Continental Governments before their introduction here. The Driggs-Schroeder gun was designed in this country, and all experimental work necessary was done here. Looking at it in this way, it must be remembered that there is a decided distinction between the revolving cannon which is now classed among machine-guns and the rapid-fire guns. The latter is of recent origin, and the first ever ordered being those now on the cruisers Boston and Atlanta, which were ordered from the Hotchkiss Company, of Paris. The idea of depending upon a foreign company to supply the Government with means of defense was not generally regarded favorably, and Congress recognized this fact by passing a law requiring the ordnance as well as the ships of the navy to be entirely of domestic manufacture. The rapid-firing guns had come to be regarded as a necessary part of the equipment of our new ships, but there was at that time no American company engaged in the manufacture of such guns. From these facts there seemed to be a prospect of the adoption of

THE DRIGGS-SCHROEDER RAPID-FIRE GUN.



1.—Breech-Block. 2.—Guide Bolts. 3.—Main-Bolt. 4.—Extractors. 5.—Firing-Pin and Spring. 6.—Operating-Handle. 7.—Sear-Bolt Spring and Cap for Holding Spring in Place. 8.—Screws for Holding Face-Plate in Place. 9.—Operating-Cam.

WORKING PARTS OF BREECH MECHANISM.

Government, in consequence of the excellence of the tests made by the Navy Department has ordered ten 6-pounders and ten 3-pounders, and has also acquired the right to use the patents under which the guns are constructed for the 4-inch caliber, paying the inventors a royalty upon each gun. The first two of the 4-inch guns of this description are now being manufactured at the gun factory at the Washington Navy Yard. The army will shortly have two calibers of these guns—a 6-pounder and a 3.02-inch gun, both of which are building and will be used to test the advantages of the system as applied to field and fort use.

A noteworthy feature connected with a good American rapid-fire gun could one be found equal in all its principal characteristics to those designed abroad. This led W. H. Driggs to design and patent a gun of this description, after which in conjunction with Lieutenant Schroeder he built a 3-pounder, which was tested at Annapolis by the Naval Department. The results there reached warranted the inventors in pursuing more thoroughly the subject, the result being new designs and new patents until the present form was reached.

CONSTRUCTION OF THE GUN.

In our article we shall briefly describe the construction and arrangement of the

several parts of the gun, and then give the main points as found in the official report of the officers who made the tests early last year at Annapolis. The drawings here presented, together with the details placed under them, show the form and arrangement of all the parts of the breech mechanism. The upper surface of the breech-block A is provided with bands *a*, which fit into recesses a^1, Figs. 3 and 4, in the upper interior surface of the breech of the gun and which extend downward a suitable distance within the walls of the chamber A^2. These bands and the grooves into which they fit firmly hold the breech-block in position and prevent the downward movement of the block during firing.

The breech-block, Figs. 6 and 7, is formed with a cavity, A^3, extending from the front toward the rear, the general contour of which is represented in the longitudinal and transverse sections Figs. 3 and 14. Formed in the front part of this cavity is a horizontal wall, 1, 2, which merges into an upwardly inclined wall, 2, 3, and in the rear part of the rectangular portion of this cavity is a round shoulder, 4, which may be either an integral part of the breech-block as shown, or a round pin immovably secured therein, the use of the latter permitting more ready slotting or cutting out of the block, and being a detail more of construction than of final operation. The central front face of the breech-block containing the cavity is left open until the latter is finished and ready for use and the cam is introduced, after which the cavity is covered by a strong face-plate, 5, held in place by locking lugs 6, screwed into it and into the cheeks of the cavity. The construction of the breech-block has been found to be convenient and advantageous in forming the parts interiorly of the cavity and in introducing the cam. In the sides of the breech-block are formed cam or guide grooves, 7 7, which are of the shape shown in dotted lines in Fig. 3 and in full lines in Fig. 6. Their lower or rear walls, 8 to 9, are nearly vertical but slightly inclined forward. From the point 9, these guide-grooves continue on in curved lines from point 10 to point 11, the two latter points being concentric with the axial bolt when in the upper part of the elongated opening in the breech-block. Projecting into these grooves are guide-studs, 12 12, which are secured in the walls of the breech. The elongated opening 13 is also formed in the breech-block in its lower portion, and is inclined upward and forward two or three degrees from the vertical, so as to allow of a down-and-up movement of the block at a slight inclination. A strong axial bolt B passes through this opening, fits in the openings of the cheeks of the breech and extends out beyond the same on the left side, where it is provided with an operating handle *b*, Fig. 5.

In the upper part of the cavity is arranged the firing pin C, which is provided at its rear end with a finger loop *c* and at its front end with an upturned head *c'*. On the under side of this pin toward its rear end are formed half and full cock studs *c''* and *c'''*, as shown in Fig. 4, and also a forwardly and downwardly extending cocking lug *c''''* is arranged near its middle. In the top portion of the cavity above the firing-pin is arranged a spiral spring D, the front and rear ends of which abutt against the upturned head of the firing-pin and the rear wall of the cavity. Before applying the face plate 5 the cam E, firing-pin C and the spiral spring D are introduced through the front of the cavity A^3. The breech block is then placed in the breech, and the bolt B inserted and securely keyed to the cam. In the left upper end of the cam E and extending its full width is formed a circular recess *e*, Fig. 8, which is struck with the same radius as the rounded shoulder 4 in the cavity of the block. Beneath the recess and in the middle of the upper part of the cam is formed a larger curved and walled recess *e'*, as shown in dotted lines in Fig. 3 and also in the rear view in Fig. 6 and which terminates in front at the point *e''* of the cam. This point, when the breech is closed, rests beneath the horizontal wall 1, 2 of the cavity and supports the block in its raised position. At the rear lower end of the cam is a toe, *e'''*, which, when the cam is turned backward, exerts a downward pressure upon the lower wall of the cavity in the block.

In the rear of the block is located the sliding leaf F, which holds and releases the firing-pin and which fits in a mortise cut in the rear face of the block and extending downwardly from the hole for the firing pin. Side views of this sliding leaf are shown in Figs. 3 and 11 and transverse sections of it and its mortise in Figs. 12 and 13, which are respectively views on the dotted lines *x x* and *y y* of Fig. 5. The upper end of the leaf is bevelled on the front side so that the inclined cocking studs on the firing-pin will press it downward when the pin is retracted and the rear side of the upper end of the leaf is straight, so as to catch the straight front sides of the studs of the firing-pin, and hold the latter at half or full cock. The coil spring, *f*, is placed in a vertical cylindrical recess, *f'*, in the rear wall of the block, and presses the sliding leaf up against the firing-pin. From the rear face of the leaf projects an arm, G, which terminates in a lip *g*, Fig. 11, having a rounded rear face. A vertical slot is formed in the arm, and the screw stud passes through the same and into the wall of the breech, whereby the vertical sliding-leaf is held in proper alignment in its mortise. A small rock shaft, H, passes transversely through the right wall of the gun breech and its inner end terminates in a recess in the wall in the rear of, but out of line with, the side of the breech-block. On the inner end of the shaft is a finger, *h*, Fig. 3, which is normally in contact with the rounded lip *g* of the arm G of the sliding-leaf, while on the outer end of this rock shaft is secured a trigger, *h'*, which projects downward beneath the usual pistol grip *h''*, and which on being pressed by the finger causes the trip to bear down upon the lip *g* and thus slide the leaf downward against the resistance of the coil spring *f*

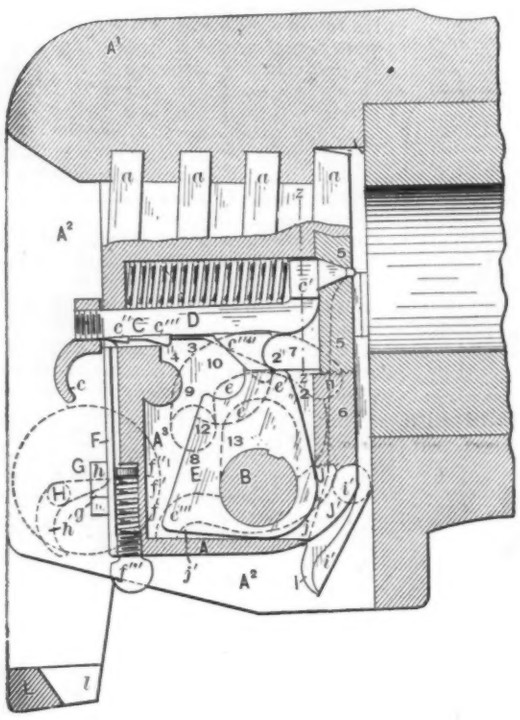


Fig. 3.—Longitudinal Section of Breech End of Gun. —Breech Closed.

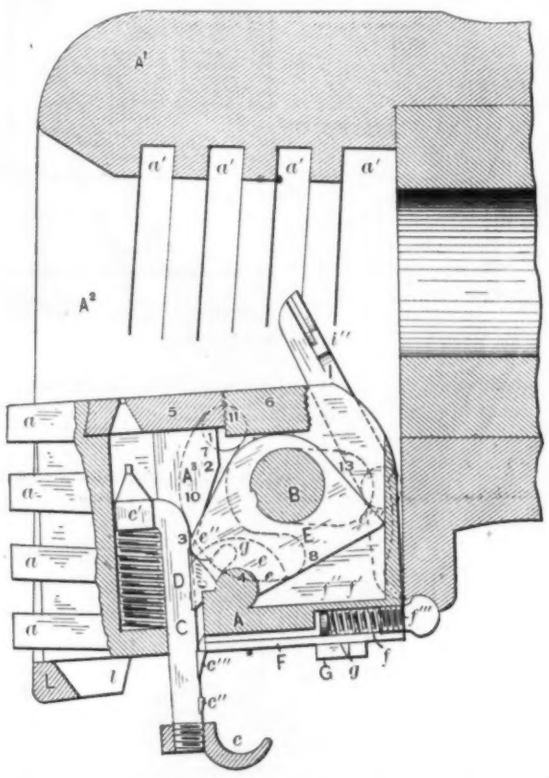


Fig. 4.—Same View with Breech-Block Moved to Allow Entrance of Cartridge.—Breech Open.

and liberate the firing-pin C, which then flies forward against the primer and explodes the cartridge.

The cartridge-shell extractor consists of two upwardly-extending arms, I (Figs. 9 and 10), provided with pivots, *i*, which project into openings in the inner surfaces of the breech forward of the axial bolt B. As the breech block is flush with or takes up the whole width of the breech chamber, the sides of the block along its bottom and front surfaces are formed with recesses, J J, which are of a depth inward from the sides of the block equal to the width of the long or main portions of the extractor arms I I, sufficient room being provided at the upper ends of the recess to permit the block to descend slightly along the extractor arms previous to the commencement of its rotary movement. On the inner sides of the extractor arms are formed curved projections, *i'*, which extend into recesses, J', formed along the lower front and bottom parts of the breech block, and which are still deeper or cut further in from the sides of the blocks than the recesses J. These deeper recesses when the breech block descends to its revolving position will bring their upper curved walls *j* in contact with the curved projections *i'* on the inner sides of the extractor arms. These upper walls *j* are circular in form for a certain distance, as shown in Fig. 6, and are slightly eccentric with respect to the center of rotation of the block, so that during its rotation the walls will press slightly and slowly against the curved projections *i'* on the inner sides of the lower ends of the extractor arms, and thus cause the heads *i''* of the arms to move slowly to the rear and pull the shell along with them. At the rear ends *j'* of the deeper recesses the upper walls *j* change in curve abruptly downward, and hence these abrupt curves coming in contact with the curved projections on the extractor-arms will, when the block has rotated sufficiently to the rear to fully expose the bore of the gun, cause the extractor-heads, *i''*, to suddenly pull or jerk the cartridge shell and throw it quickly to the rear.

In an opening formed in the operating-handle *b* attached to the projecting end of the axial bolt is secured a spring catch, K, which, as the cam is completing its forward movement and the bore is being closed by the breech block, takes into a recess *k*, Fig. 15, formed in the exterior surface of the wall of the breech. The rear end of this recess is so sloped as to not too much retard the rear movement of the spring-catch when opening the breech, and yet there is sufficient resistance between the catch and the sloping part of the recess to prevent backward movement of the breech block by any jar or concussion arising from the firing of neighboring guns. The front end of the recess terminates against a vertical wall, *k*,' which, in connection with the spring-catch, prevents more rotation of the handle *b* and the cam E than is necessary to close the breech; also when the catch strikes against the vertical wall a clicking sound is produced, indicating that the breech is completely closed and secure.

Secured within the interior surfaces of the breech walls and suspended therefrom at the extreme rear of the gun-breech is a strong tray L, which receives and sustains the weight of the breech-block when it is turned back and the bore is open for loading.

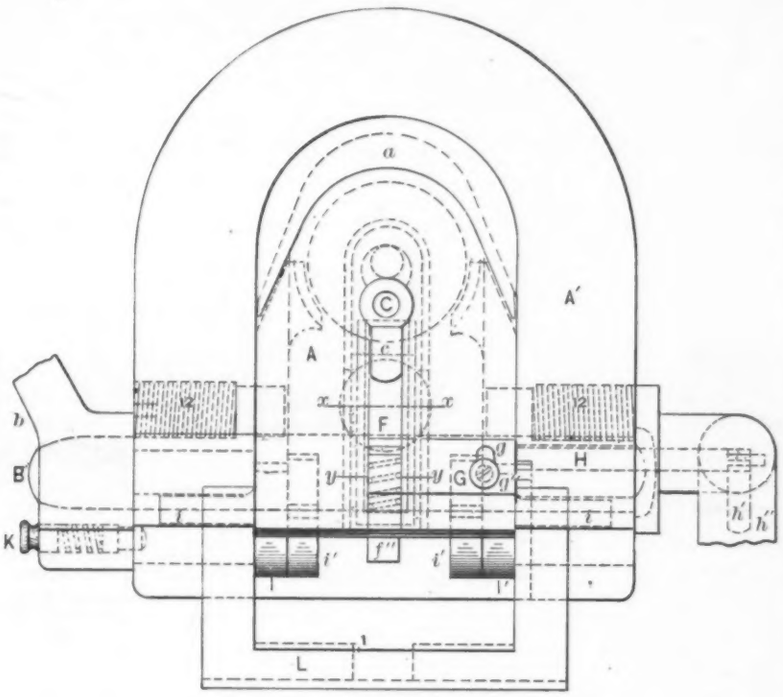


Fig. 5.—Rear Elevation of Breech.

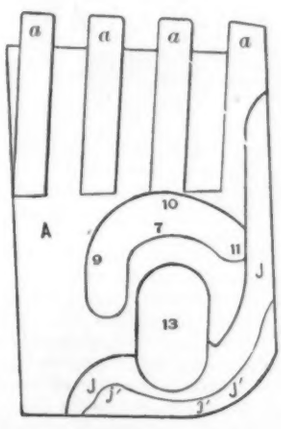


Fig. 6.—Detail Side View of Breech-Block.

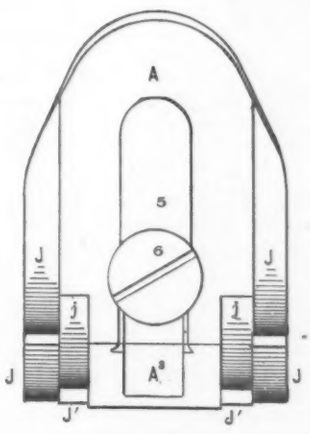


Fig. 7.—Front View Fig. 6.

OPERATION OF THE PARTS.

The operation of the several parts of the gun not made obvious in the foregoing is as follows: In Fig. 3 the breech of the gun is represented as closed or as it would appear after a discharge. To open the bore the handle is pulled to the rear, thereby turning the axial-bolt B and the cam E. When the latter has been turned back a sufficient distance to cause its front point *e''* to pass out from beneath the horizontal wall, 1 2, of the cavity in the breech-block the toe *e'''* of the cam will press down upon the bottom wall of the cavity and force the block downward, this movement being permitted by the point *e''* of the cam moving along the inclined wall 2 3 of the cavity. After further turning the cam its circular recess *e* embraces the round shoulder 4 in the cavity, and after this the further rotation of the cam is necessarily accompanied by the rotation of the block, which by this time has descended far enough for its bolt to move to the upper part of the elongated opening 13 and for the bands *a a* to clear their grooves *a' a'* in the gun breech. After this the movement of the block is rotary and to the rear around the axial bolt. During the first part of the downward movement of the block its guide grooves descend over the pins, 12, 12, until the latter occupy the points 9, 9, in the grooves, and during the further rotary movement of the block these pins successively occupy the positions 10 and 11 in the guide grooves, at which last points the grooves are concentric with the axial bolt when in the upper part of the elongated opening 13.

To return the breech block and close the bore the handle is moved forward. At first the rounded shoulder 4 remains engaged in the circular recess *e* of the cam and causes the block to swing upward. In the mean time the guide grooves 7, 7, in the sides of the block, move over the pins 12, 12 and change position from point 11 to point 10. On reaching the latter position, in consequence of the change of the curves of the grooves, the upper surfaces of the grooves take against the pins and are moved upward, thus forcing upward the breech block, and disengaging the rounded shoulder 4 from the circular recess *e* of the cam. The front point *e''* of the cam then commences to impinge at the point 3 in the cavity and the rotary motion of the cam continuing, moves along the inclined wall 2, 3, and forces the breech block upward. In the meantime the guide-pins change position in the grooves 7, 7, moving from points 9 to points 8; also, the bolt B changes position from the top to the bottom of the elongated opening 13. The point *e''* of the cam finally supports the

breech block in its raised and closed position. Further forward motion of the cam is prevented.

As the cam E rotates rearward and the block descends, the cocking lug c'''' of the firing-pin takes against the bottom of the curved recess e' formed in the middle of the upper rear part of the cam and is moved rearward, the portion of the cam in front of the recess passing up into the curved front part of the cocking-lug. This retracting movement imparted to the firing-pin is effected against the resistance of the spiral spring D, which is thereby contracted, and the movement continues until the circular recess in the cam embraces the rounded shoulder 4 in the cavity, when the motion of the cam and firing-pin ceases. When the recess of the cam comes in contact with the rounded shoulder the full-cock stud c''' of the firing-pin has passed to the rear of the block and is caught by the sliding-leaf.

The construction and arrangement of the parts of the breech-block in relation to the breech are such as to resist the backward and downward pressure upon the face of the block resulting from the force of explosion.

TESTS OF THE GUNS.

In the official reports describing the tests made of these guns several strong points are brought out in their favor. These we will briefly summarize in the case where they touch the principal features of construction. In the report on the 3 pdr., dated February 15, 1888, it is stated that the maximum pressure developed in the bore was 18 tons. Under this and frequent repetition of lower pressures the breech block showed no signs of weakness, and was considered strong enough both in itself and in its support. The same remark applies to the extractor mechanism. Experiments were made to determine whether the cap could be snapped and the gun fired before the breech had been fully closed. There was found to be no possibility of such an accident, the arm of the cocking cam being always interposed to prevent the firing pin from striking the cap until after the breech had been locked. This was fully demonstrated during the rapid-firing tests, when it was found that the greater number of missfires resulted from the cartridges fitting too snugly and the breech not being quite closed. Tested in the half-cock position, which is a feature peculiar to this gun, it was found to be free from danger and that it could be fully cocked again without moving the block or handle. The extreme lightness of the breech block as compared with other guns of this class, and also the fact that the block revolves upon an interior axle, the handle of which carries the full weight of the block only for a very small portion of its motion, are points of essential value in handling the gun easily and rapidly.

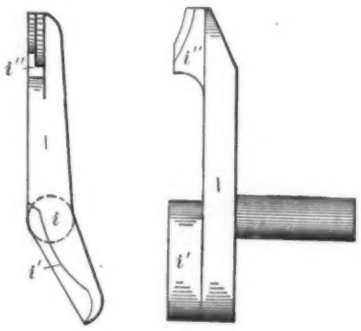
Although it is usual in testing cases of this kind to employ expert crews who have had much actual practice, in this case all tests were made by two officers assisted by an employee of the station. They found no difficulty in firing eight rounds in 13 seconds, this being at the rate of over 36 a minute. In the trials for rapidity but two men were engaged in working the gun, the third being employed in passing ammunition. The report shows that this number is sufficient for working the piece effectually except in long rapid firing, when a relief must be at hand for the loader, as would be the case with any other system. This permits a reduction in the crews of vessels of one man for every rapid-firing gun on board.

Concerning the ease and rapidity of pointing, one report states that as the shoulder-piece is on the right-hand side and the handle on the left, certain marked advantages are brought out. The operator can work the handle perfectly with his left hand, his right hand being free for handling and inserting the cartridges. It was found in actual firing that this arrangement not only did away with one man of the crew but that it was much better than to have four men. As the same man inserts the cartridge and closes the breech there can be no danger of jamming the cartridge or the hand by starting up the block too soon.

The saving of weight effected in the breech-closure is utilized by increasing the length of the bore without increasing the total weight of the gun. The result of this is an increase of the muzzle velocity. This gun has two independent extractors, either of which will eject the empty shells. If one should become disabled, therefore, or if a strain on the rim of the cartridge should be so great as to pull it off, the gun would not become disabled, since the extractor on the opposite side would then come into play. The entire mechanism is protected by the hood of the breech.

An essential point is found in the rectangular motion of the firing-pin, which causes it to strike the cap fairly in line with its motion, so that no bending strain is brought upon the pin, as is the case in guns where the hammer has a circular motion. This construction also admits of a much smaller point, which in turn requires but a small hole in the face-plate, and therefore greatly increases the support of the cap and decreases the chance of escape of gas into the mechanism. The tests which have been so far carried out by the Government have shown the superior merits of the gun, and it is to be expected that those now building will not only equal the performance of those heretofore tested, but may in some regards excel them, this belief being founded upon the design and construction of the operating parts of the gun in which slight changes may be found to result advantageously.

Fig. 8.—Rear View of Cam.



Figs. 9 and 10.—Side and Rear Views of Extractor-Arm.

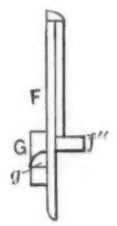
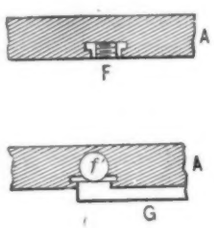


Fig. 11.—Edge View Sliding-Leaf for Holding and Releasing the Firing-Pin.



Figs. 12 and 13.—Horizontal Sections of Breech-Block and Sliding-Leaf.

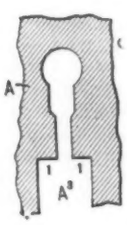


Fig. 14.—Vertical Section of Part of Breech-Block.

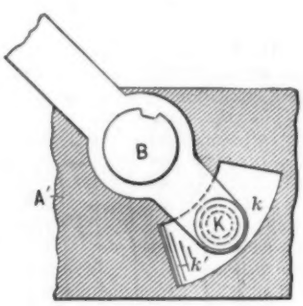


Fig. 15.—Broken Side View of Breech and Operating Handle.

The Western Society of Engineers.

The annual meeting of the Western Society of Engineers was held at Chicago on the 8th inst. Some 60 or more engineers were present, among them General Fitz Simons, William R. Northway, L. E. Cooley, Horace E. Horton, O. Chanute, A. Gottlieb, George B. Waite, S. G. Artingstall, E. T. Osborne, O. B. Green and C. L. Strobel. E. L. Corthell, the president, being absent in New Orleans, Gen. Fitz Simons was called upon to act as chairman. Reports of the secretary, treasurer and librarian revealed that the affairs of the society were in a highly flourishing condition. It has 255 members, good quarters, is self-supporting and has no debt.

The annual election resulted in the following gentlemen being called on to fill the offices: L. E. Cooley, president; Robert Shaler, first vice-president; William R. Northway, second vice-president; John W. Weston, secretary and treasurer. Benezette Williams was elected trustee, vice H. A. Rust whose term had expired.

A paper by E. L. Corthell, the retiring president, of which the following is a summary, was read by Secretary Weston:

It would be difficult to find any section of our great country where there are greater demands upon the civil, mechanical and electrical engineer than that section of the country of which Chicago is the central point. Perhaps nothing will bring this out more vividly than a summary of a statement recently prepared to show the importance of this city as a transportation center, a place to receive and dispatch goods and to move great masses of people.

When it is remembered that the vast system of railroads which does the immense business stated in this summary has mostly been built within the last 30 years, and that every mile of it was staked out and built by an engineer, the importance of our profession in this great branch

of commerce will be appreciated. Piers, docks, elevators, harbor works, all are necessitated by this transportation business by rail and lake. The river which meanders through the heart of the city requires bridges and tunnels for crossing it, and that same river (if it be a river) receives the sewage of nearly 1,000,000 inhabitants, and yet has no natural outfall except into the lake whose waters those inhabitants drink. This state of affairs in a city growing like ours has led to a development of plans and nearly to their realization which will not only, when carried out, remove from us through the purifying influence of a great body of fresh water flowing toward the Mississippi the sewage of the city, but will also furnish an enlarged water-transportation between the Great Lakes and the Gulf of Mexico. Here, certainly, is a field for the highest class of engineering; here are difficult problems in hydraulics and in construction which are presented for immediate solution.

Let it be remembered that the metropolitan district of Chicago has not attained its growth—far from it. That growth is still phenomenal among the cities of the earth, it being estimated by statisticians that the rate of growth at the present moment is 900,000 per decade, with an increasing increment. No one can forecast the future or predict the magnitude of the city where we have cast our lot as engineers, nor can any one measure the possibilities which are before us as a society of engineers.

Certainly these conditions, so important and so grand in their future results, demand of us not only to give ourselves to the engineering problems as they come rapidly following each other, but that we should organize ourselves as professional engineers into a society in order that we may be the better able to discuss, to solve, and to successfully handle the problems as they are presented. It is a satisfaction to know from the report of our secretary that the Western Society of Engineers, whose headquarters are in this city, is not in a moribund condition, but in one of active growth, for his report shows that the increase in membership during the last year has been 40 per cent. of the entire membership at the beginning of the year, and it is safe to say that this membership is an active one. This society has arrived at that point where there should be only active membership, and where every one should take hold in earnest to make the society with its meritorious objects an eminent success and of great usefulness in the important section of the country where it is placed.

The subjects which we discuss should be live subjects, those pertaining to the great engineering wants of our country and of our city. All of us have some experience in our work. We have all accomplished something, the relation of which will be of interest and profit to the others, and hardly any subject which involves the construction of public works can be described without eliciting discussion, which in itself will be of advantage. A most earnest appeal is therefore made to the society to bring forward for information and for discussion the results of experience, the results of thought and of plans which have been carried out or which exist only in the brain of the engineer.

The Treasury Department has called for proposals for the construction of a steam propeller for the revenue service of the following dimensions: Length over all, 138 feet and 6 inches; length over load-line, 126 feet and 8 inches; breadth of beam, 26 feet and 2½ inches; depth of hold, 9 feet and 2½ inches; draft, 5 feet, and displacement, 247. The vessel is to be stationed at Newbern, N. C., and the cost is limited to $75,000.

ALUMINUMIZED COPPER.

BY ROMAINE COLE, WATERBURY, CONN.

Charles Martin Hall, the inventor of the Hall electrolytic process for smelting aluminum direct from its oxide, made aluminum and aluminumized copper by his process over five years ago, but unlike most investigations in this line the first evidences of success were not heralded to the world with flourish and blast of trumpet. Instead, the work of perfection in all its details went quietly on known to but comparatively few people, and it was years after the first production of aluminum and its alloys by this process before any facts were given to the public.

Among the first aluminum products produced by the Hall process was what is generally called aluminum bronze. In making this alloy copper electrodes were used instead of carbon.* The pure aluminum upon being reduced from the ore combines more or less with the copper of the electrodes, which leaves a product containing often as high as 50 per cent. pure copper, the balance, of course, being aluminum. This is a highly crystalline, brittle product that has apparently no value for the arts, except when melted in a crucible or reverberatory furnace with enough more copper to make the percentage of the latter at least 90. In this alloy we have what is commonly termed "10 per cent. aluminum bronze," which is particularly remarkable for its great strength. As we continue in the scale—increasing the percentage of copper—we likewise decrease the strength and elasticity of the alloy, but increase the malleability, ductility and rich golden color.

By reversing the scale and increasing the percentage of aluminum above 10, the product rapidly becomes brittle and bluish-gray in color till we approach 90 per cent., at which point the alloy begins again to become malleable, which property increases the nearer the approach to pure aluminum.

A very peculiar effect observed in these alloys of high percentages of aluminum when made in the electric furnace is their sponginess or extremely porous condition. Pigs of aluminumized copper run from these furnaces and containing usually from 12 to 20 per cent. of aluminum are so cellular and full of what might be called blow-holes that at first sight the product might be taken for a very spongy steel casting. This appearance is further hightened by an intense steely-blue color. It is thought that the gas which produces these blow-holes is silicide of hydrogen, but I am not prepared to say that this point is accurately settled yet. The blow-holes are apparently more abundant in proportion to the percentage of contained silicon, which would seem to help out the opinion that the gas referred to is the silicide of hydrogen.

This spongy appearance does not appear in the alloys of aluminum and copper made by the Hall process, either if the alloy be made direct with copper electrodes in the manner above described or by melting the pure aluminum with copper in the crucible in any proportion.

That copper appears to have a natural love for aluminum is evidenced by the fact that when the two metals are melted together in the crucible in the ordinary way they combine with considerable evolution of heat, thus indicating a chemical affinity. We have here what might be technically termed a true chemical solution of two metals, in contradistinction to mechanical mixtures such as the alloys of copper and tin. If the copper bath is allowed to become too hot before the introduction of the aluminum, the union of the two metals is accompanied with so great a disengagement of heat that it partially melts the sides of the crucible and renders the entire mass so highly incandescent as to be quite blinding.

This same effect is observed when alloying nickel and aluminum together. To prepare a bath of nickel requires, of course, a very high temperature, and as this heat phenomena referred to is only so very intense when the metallic bath prepared for the reception of the aluminum has been raised beyond a certain temperature, it would therefore be particularly noticeable in the case of nickel alloys.

By carefully watching the bath of melted copper during the time that the pure aluminum is being added, it will be noticed that the instant the aluminum is melted it diffuses itself throughout the entire mass like a cloud, completely changing the whole appearance of the bath. Both physical and chemical tests made of samples cut from various sections of 2½, 5, 7½ or 10 per cent. aluminumized copper castings tend to prove that the aluminum unites itself with each particle of copper with uniform proportion in each case, so that we have a product that is free from liquation and highly homogeneous. It has been stated that the difference between the specific gravities of copper and aluminum being so great the alloys could not be made in a crucible like tin, copper, bronze. Those who have made this statement mean to infer, I suppose, that the aluminum being the lighter of the two metals would float on top. Or it may be that the inference to be drawn is that a combination of the two metals cannot be accomplishod without the aid of electric heat. However this may be, the facts and every-day practice entirely disprove the assertion, and not only do they disprove it, but they demonstrate pretty effectually that the method of melting pure aluminum and copper together in a crucible, as brass and other bronzes are made, is not only more practical and a much more satisfactory way of producing the alloy, but that the product is purer and runs more uniform than a similar product made in the electric furnace where copper, an ore of aluminum and carbon are smelted together as one charge, the reduction being effected by the combined action of carbon and high heat in one process, while in another similar process the action is claimed to be electrolytic. By both of these methods, which are strictly alloy processes, the caster is given an ingot of what is called 10 per cent. of aluminum and 90 per cent. of copper. He can be sure that these are the exact percentages of the two metals contained therein only by making a chemical analysis of each ingot, which, of course, is expensive and altogether impracticable. In making certain mixtures a variation of, perhaps, a small fraction of 1 per cent. of the aluminum contained therein might so alter the product as to render it worthless for a specific purpose. With pure aluminum and pure copper, in separate piles by his side the caster or molder can weigh out his proportions accurately. He knows exactly what he is putting into his crucibles and he is as certain that his mixtures run uniform as he is when melting copper, tin or zinc together.

Deville, Mierzinski, Percy, Watts, Tissier Bros., Kerl & Stohman, Bell Bros. employed the crucible method entirely for making their aluminum alloys, and to-day this is the method preferred by the French in the manufacture of jewelry and fancy articles of aluminumized copper which one sees in so many of the Parisian shops, and which from their close resemblance to gold are exceedingly rich and handsome. A certain color is obtainable with 4 to 5 per cent. of aluminum in copper that cannot be secured with tin and copper, or tin,

* See article on aluminum in *The Iron Age* of December 12, 1889.

copper and zinc. It cannot be very well described, but it is distinctly characteristic. It is because of this rich color, its close resemblance to 18-karat gold, together with the natural power of the metal, when sufficiently free from silicon and iron, to maintain its color under the corrosive effects of air and water that renders this particular alloy extremely desirable for elegant chandeliers, lamps, candelabra, works of art and fancy metalwork of all kind for interior decoration. A combination of the pure aluminum with the 5 per cent. aluminumized copper in this kind of work produces fine effects. High price cannot be any longer urged against this metal, as the recent reduction in the price of pure aluminum made by the Pittsburgh Reduction Company, of Pittsburgh, Pa., and by the Scovill Mfg. Company, of Waterbury, Conn., brings the price of aluminumized copper to about the same as that of tin-copper bronze, when the difference in bulk is considered. Pure aluminum at $2 per pound is as cheap to use as nickel at 52 cents, because of the difference in bulk of the two metals, and the same law holds good in figuring the cost of the aluminumized copper alloys as compared with the tin-copper alloys. The specified gravity of cast-tin is 7.29, while that of cast-aluminum is only 2.56; it follows, therefore, that in bulk 1 pound of aluminum will go as far as 2.85 pounds of tin. No one can question, I think, the fairness of this comparison, for 1 pound of aluminum, whether alone or alloyed with copper, will fill the crucible just so much more than 1 pound of tin; hence, 1 ton of aluminumized copper will make in proportion so many more castings off the same pattern or so much more sheet or wire of same width and guage than 1 ton of tin-copper bronze.

Respecting the anti-corrodibility of aluminumized copper, it has been, perhaps, too generally advertised that this metal is absolutely free from the corrosive effects of the atmosphere and water. This is not true. There is no metal known but what will not in time corrode more or less under these influences. The power to withstand this corrosion varies only in degree in different metals. Aluminumized copper simply possesses this power to a higher degree than tin-copper bronze or brass, and it consequently requires just so much less attention to keep any article made of the metal looking clean and bright.

Apropos of this point, the following extract from a letter written by a Cleveland gentleman dated at Paris may prove of interest: "I have visited the church of St. Germain, where there are 12 beautiful candlesticks, 6 feet high, of aluminum bronze. These have been there 20 years, together with a beautiful casting of Christ on the cross, 4 or 5 feet high, of aluminum bronze. Their color is perfect, and the priests in the church all unite in praising the bronze. At Salindres we found the window and door trimmings of the principal house all of aluminum bronze, with some ordinary brass and bronze in a few instances; so we were able to make a comparison of the actual qualities of the two bronzes. Neither had been cleaned for 25 years, the building having been deserted for that length of time. The aluminum bronze was in a remarkably good condition, being only discolored by fly specks and cob-webs, while the ordinary brass and bronze were almost black. In fact, I do not think aluminum bronze changes at all after three months of exposure, while ordinary brass or bronze gets constantly worse and worse."

From the above it would appear that after 25 years of exposure aluminumized copper will still retain a distinctly yellow color, while brass and ordinary bronze will look like cast-iron.

This quality of resisting tarnishing agents, however, is very consideraably diminished if the percentage of silicon in the alloys exceeds a small fraction of 1 per cent. Iron also exerts a detrimental effect in this respect and should be avoided as much as possible. These two impurities—silicon and iron—are the most objectionable as well as the impurities most commonly met with in these alloys.

The purest aluminumized copper is made by melting together in the crucible pure aluminum and pure copper. The alloys manufactured in this manner can be considered practically free from all impurities.

Besides diminishing the power to withstand corrosion the effect of these impurities is to harden the metal and make it a refractory material to work. This hardness is particularly objectionable in metal that is to be rolled into sheets or rods, drawn into wire and tubes, spun or stamped. In all wrought metal work, therefore, it is desirable to use the purest aluminumized copper that can be made, and this is also true of art or ornamental castings. In ordinary machine castings, however, where only maximum strength or hardness are required, the presence of silicon and iron is no objection in many cases. As previously stated, the effect of these impurities is to greatly harden and strengthen the metal. I have frequently tested castings of aluminumized copper stamped and sold as "10 per cent. aluminum bronze," whose tensile strength to the square inch equaled 100,000 pounds, whose elastic limit averaged two-thirds the tensile strength, but whose elongation was generally *nil*. These alloys were not made from pure aluminum and copper, as analysis showed that they contained instead of 10 per cent. aluminum only 7½ per cent., with about 2½ per cent. of silicon and a small percentage of iron; yet in the qualities of tensile strength, elasticity and hardness alone they fully equaled the pure 10 per cent. alloy. The physical superiority of the pure alloy will at once be seen, however, upon measuring the elongation, which exceeds 14 per cent., while in the impure product of this grade it rarely equals 5 per cent.

What a wonderfully valuable metal this 10 per cent. alloy is to the engineer! Consider the facts that we have in this grade a copper alloy the physical properties of the castings of which compare favorably with wrought open-hearth steel; a metal that is practically free from rust or corrosion, which can be forged or worked hot with almost the same facility as iron, and which when worn out is as good to melt over again as the original ingot. It is difficult to imagine a metal better adapted for propeller-blades, mining-machinery, gears, pinions, pump-rods, valves, &c., than this 10-per-cent. grade of aluminumized copper.

With reference to ordnance and speaking of aluminumized copper for this purpose, Birdsill Holly, inventor of the Holly system of city water-works and the Holly system of steam-heating, says: "I have long been of the opinion that if we could double the strength and elasticity of ordinary bronze we would have a metal superior to steel for guns." Dr. R. J. Gatling, inventor of the Gatling gun, Hartford, Conn., "believes that the coming large cannon will be a gun cast of either steel or aluminum bronze," while Prof. R. H. Thurston, dean of the department of mechanical engineering, Cornell University, and formerly of the Engineer Corps, United States Navy, stated in a discussion on aluminumized copper before the Naval Institute over two years ago the following: "A gun composed of a metal approaching 100,000 pounds tenacity and above 60,000 pounds elastic limit, having measurable extension and ductility, hard, unoxidizable, cheap in construction and durable under wear, would seem to promise well. It certainly would justify the most careful and extended investigation on the part of ordnance officers."

By way of parenthesis, permit me to say that I do not think that any advocate of aluminumized copper for heavy, high-power guns considers that the bore is sure to stand the terrific heat effect produced by the immense service charges used in such guns without a steel-tube lining. For field artillery and rapid-firing guns of smaller caliber such a tube would probably not be necessary. The fusing point of the 10 per cent. grade of aluminumized copper is about 1800° F., but before this temperature is reached by several hundred degrees the metal becomes plastic. Heating to 450° F. appears to make no change either in the strength or ductility of this grade of metal, and it is not unlikely that even higher temperatures would not materially affect its physical properties, but upon approaching a dark red heat the metal rapidly becomes soft and ductile, and hence would be easily abraded and distorted. I do not suppose that even in guns of the greatest caliber this temperature is often if ever reached after repeated firing; still, until experiment proved the contrary the steel tube would, I think, be favored.

Since Professor Thurston called the attention of ordnance officers to this metal over two years ago, the Government has made a few tests of the metal, and a very few. Unfortunately these tests were made with a product that was very variable in many instances in homogeneity, strength and elongation. This created considerable prejudice among certain officials that very likely still exists. If these same tests had been made with aluminumized copper produced in the crucible from pure aluminun and pure copper this lacking in uniformity would not have occurred, for reasons that have been before stated.

The following are the prices paid by Carnegie Bros. & Co., Limited, for manganese ores delivered at Bessemer, Pa. Prices are based on ores containing not more than 8000 silica and not more than 0.100 phosphorus, and are subject to deductions as follows: For each 1.000 silica in excess of 8.000 15 cents per ton. For each 0.020 phosphorus in excess of 0.100 1 cent per unit of manganese:

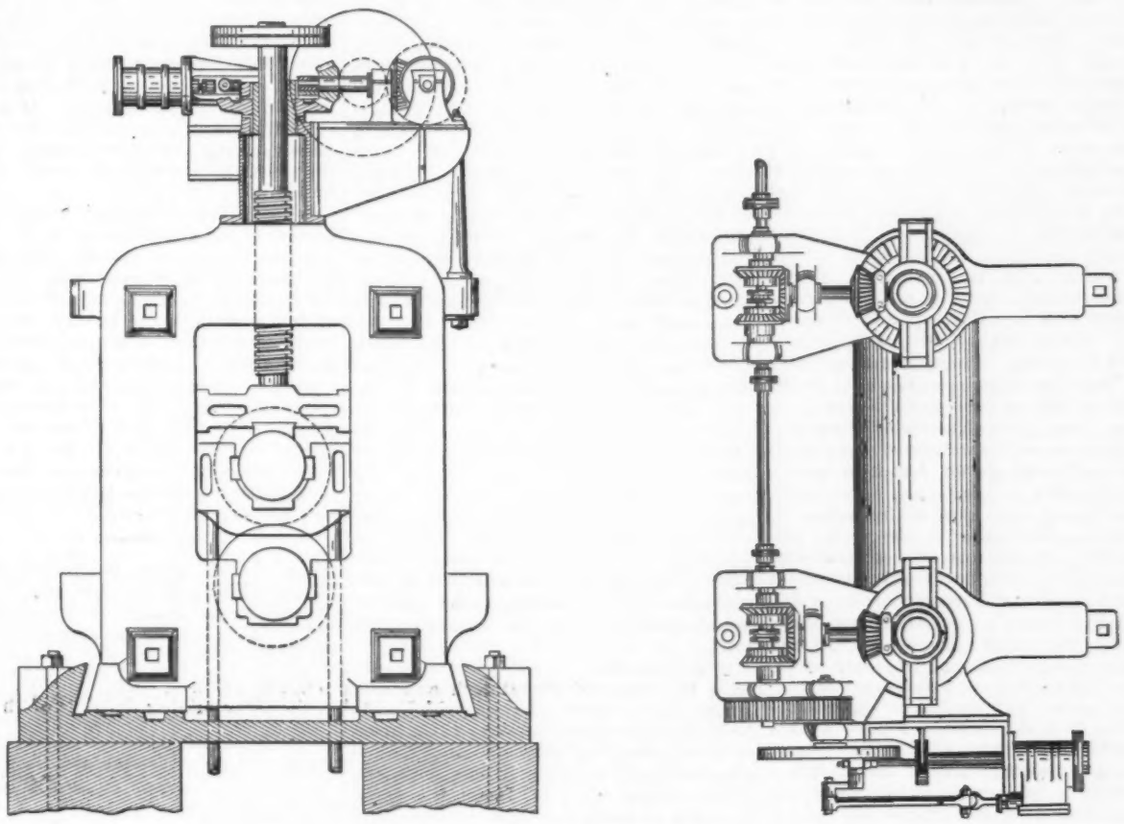
Manganese ore containing above	Prices per unit. Iron. Cents.	Manganese. Cents.
to 49.00	10	34
47.00 to 49.00	10	33
45.00 to 47.00	10	32
43.00 to 45.00	10	31
40.00 to 43.00	10	30
33.00 to 40.00	10	29
32.00 to 36.00	10	28
28.00 to 32.00	10	26
24.00 to 28.00	10	24
20.00 to 24.00	10	23
16.00 to 20.00	10	22
12.00 to 16.00	10	21

Settlements are based on analysis made on samples dried at 212°, the percentage of moisture in samples taken being deducted from the weight. These prices are subject to change without notice unless otherwise specially agreed upon.

In the tariff hearing before the committee of Ways and Means, J. B. Torrey, of Worcester, Mass., a cutler, told of the bad effects of the competition of German manufacturers upon the razor industry in this country. He said that he had to import the steel to make the razor blades from Sheffield, England, because American steel did not run of even grade. About seven-eighths of the razors used in the United States are imported, and the domestic makers would like to have the duty increased. It would not increase the cost to the consumers, and in three years the selling price would be still lower than at present. The man who ground their best razors got $5 a day, while in Germany they get $10 a week for the same work.

Screw Rolling-Mill Gear.

The accompanying engravings, for which we are indebted to the *Engineer*, illustrate Jardine's patent screw-gear for rolling-mills, as made by Messrs. Grieve, of Motherwell, N. B. The engraving shows gear that has been working for some months on a plate rolling-mill in Messrs. David Colville & Sons' steel-works, and is the first gear of the kind on any rolling-mill. By means of this gear one man is easily able to control both screws, which, before the introduction of the patent screw-gear, required four men to turn them, two at each screw. The screws are turned in either direction entirely independent of each other by means of two sets of miter-wheels with double friction-clutches. These clutches are so sensitive that the screws can be adjusted to the gauge as accurately as by hand. The screw-gear is driven by a small single cylinder-engine attached to the housing, but the driving power could be taken from any available source by means of shafting. The screws can be turned either by means of a worm and worm-wheel or by bevel wheels, as shown in detail. Where it is not necessary to work the screws independently, only one set of miter-wheels with friction-clutches is necessary.



End Elevation. *Plan.*

SCREW ROLLING-MILL GEAR.

A Trade-Mark Decision.—The decision of the Supreme Court given in the trade-mark litigation between Daniel Frank & Co., the cigar dealer, and S. S. Sleeper & Co., wholesale grocers, of Boston, will prove interesting to trade-mark owners and trade-mark lawyers throughout the United States. It is said that this is the first trade-mark decision by a court of last resort in this country which decides in an affirmative proposition that initial letters can constitute a valid trade-mark. The litigation of Frank against Sleeper arose over the use by the latter of the letters N and S on a brand for cigars, which Frank alleged was a studied infringement upon his well-known brand of cigars, the N. S. The hearing on the facts came in last May in Chambers, when Justice Charles Allen held defendants' conduct to be an infringement, and ordered a perpetual injunction to issue. An appeal was taken by Sleeper & Co., and the full court has now sustained the finding by Judge Allen.

The Round Oak Trade-Mark.

A decision possessing more than usual interest to the stove trade is that recently rendered by Judge Allen, of the United States Court, in the case of Howard and Lee, executors of Phil. D. Beckwith, deceased, against Abram S. Ruark, of Carlinville. The decision was made on Tuesday, December 24, and in it Judge Allen holds that the complainants have a valid trade-mark in the words "Round Oak," as applied to a heating stove, and orders an injunction to issue forthwith, restraining the defendant from any further use of the words "Round Oak," either in advertising stoves for sale or in any other way or manner using those words as a means of effecting a sale of heating stoves.

In announcing this decision the Illinois *State Journal* gives the following particulars of the origin of the suit which are of interest in this connection: About two years ago Mr. Beckwith began the manufacture of the Round Oak heating stove at Dowagiac, Mich. At first it met with but a limited sale, but by applying to it all his skill and labor for many years he developed it into what complainants claimed to be the best and most economical heating stove known to the trade, and from a small number of sales in each year it reached as high as 25,000, and what was at first only a small plant giving employment to only a few men now covers acres of ground and gives employment to 300 skilled laborers. Over $100,000 were used in establishing a market for the stove and now over $300,000 capital is invested in its manufacture. This stove has always been called and known to the trade as the "Round Oak," and is so perfect, economical and popular that, as complainants claim, other heating stoves cannot be sold in honest competition with it.

In order to compete with it other dealers about the country have appropriated the name "Round Oak" in advertising and selling other stoves and used this name in representing other stoves to purchasers. These practices have been extensively resorted to by dealers since the death of Mr. Beckwith, which occurred in February last. It is this conduct and practice that Judge Allen holds to be illegal and from the further commission of which he restrains the defendant. Other suits are to be brought in different courts, and upon the decision in this another case was immediately commenced here against a dealer in this city. Complainants say their trade-mark is of inestimable value to them, and that they intend to protect it at all cost. A whole day was spent in the argument of the case, and Judge Allen, after hearing the argument, personally examined all the authorities cited before rendering his decision.

Assistant Secretary Tichenor has informed the United States Appraiser at New York that where goods are purchased in bond in a foreign country the tax or duty does not form an element of market value.

Thorsten Nordenfeldt, civil engineer and manager of the Maxim Nordenfeldt Gun and Ammunition Company, has been declared a bankrupt. His liabilities amount to $250,000.

THE VERMILION RANGE.

From an exhaustive article on the Vermilion iron-ore range of Minnesota which appeared in the St. Paul *Pioneer-Press* we take the following extracts:

"The range is now six years old, and its record since the opening has been as follows: 1884, 62,124 tons; 1885, 225,484; 1886, 306,954; 1887, 390,467; 1888, 502,039; 1889, 836,198; total since the mines were opened, 2,322,286 tons. Previous to last year the mining on the range was all done by one mine—that of the Minnesota Iron Company. The Chandler mine shipped its first cargo in September, 1888, and this year was one of the half dozen largest producers in the Lake Superior country. For the last three or four years up to the present, the Minnesota mine was the champion producer of the Northwest, but this year the Norrie on the Gogebic range outstripped it by a few thousand tons. It must be remembered in comparing the output of other mines and ranges with those on the Vermilion, that the latter produce a great deal more iron to 1 ton, for Minnesota iron runs over 68 per cent. pure iron, while on the other ranges the per cent. is about 60. The quality of Vermilion ore is the chief pride of the people of this section, interested in iron, for there is no other ore in the world, with the exception of the Swedish and the Spanish ores which can compare with it. The ore on the whole range, with only a few rare exceptions, is a hard Bessemer. One or two locations of soft Bessemer have recently been found similar to that of the Gogebic range.

The extent of the Vermilion range is as yet hardly known, so much of it is unexplored and undeveloped, but it is known to be greater than that of any other range. Some idea of what it is will be gained by the statements made below as to new properties. It extends over a very great area, and if it were developed only so far as good properties have already been discovered, it would easily ship from 4,000,000 to 5,000,000 tons a year, or half the estimated output of the whole Lake Superior district for next year, and further developments will probably increase the number of good properties on the main range, to say nothing of the extreme western and eastern ends of it. This is a part only of Minnesota's iron deposits, for on the Mesabi range further south, there is a vast deposit, which has as yet hardly been explored, and whose extent and value remain to be shown in the future. The importance of this statement, which is a conservative one, can hardly be estimated in its bearing on the future of this section and of all Minnesota and the Northwest. It is estimated that for every ton of ore placed on the docks at Two Harbors there has been expended for labor in various ways from $2 to $2.50. This means a total expenditure by the mines now in operation and by the railroads and docks the sum of from $1,800,000 to $2,400,000 annually, and with the product of the range increased to four times the present amount, the figures for labor will be so great as to fairly startle one. A population of from 50,000 to 75,000 people will be supported by the iron interests of the range ultimately.

The immediate future development of the range cannot with any degree of accuracy be pointed out, owing to a complicated series of litigations over the titles of mining properties and for other reasons, but all indications seem to indicate that it will show a growth in the next two years far greater than in the past. For the coming year the estimated output is roughly placed at something like 1,200,000 tons. It is hardly likely to fall below and may greatly exceed those figures. The Minnesota mine will very largely add to its shipments, but no official estimate has been obtained. The product of the Chandler will be about the same as that for the past season. Manager Sellwood, of the Chandler Company, says that the mine does not cover much ground, and 'we have crowded it just as strong as we could the past year, and we will be very well satisfied to do as well in 1880 as we have this season. We are doing some work outside by way of exploration, but I cannot say yet whether there will be any new mines shipping next year.' Some ore will doubtless be shipped from the new locations if conditions are favorable and railroad connections are made with new properties.

Some of the developments and mining of the immediate future will be from some of the properties named below. They comprise the greater portion of the locations which are likely to take their places as producing mines within the next year or two. In the immediate vicinity of the Chandler Mine there are a group of properties which have been explored and developed to such an extent that they show that at a good working they will produce at least 400,000 tons of ore a year. Some of these properties have recently changed hands and new capital has been invested in them. Among these are the Pioneer, the Zenith, the Section 26 Mine and the Lockhardt. The new capital will open up and make shipment from some of these mines at once. The ore lies deep in some cases, and there must be much work before they are ready to ship. These mines will very largely increase the output of the Ely district. Developments of the past summer show a range about three-quarters of a mile south of Ely, which has become known as the Sheridan district. Here large bodies of soft hematite ore have been found to exist, with an extent of from two to two and a half miles. The ore is very easily handled, and when shipping begins the output will be very large. Should the developments still being carried on show up as well as they have so far, large shipments will be made next year.

The properties are but a short distance from the track of the Duluth and Iron Range Road, and a track could be extended to the mines in a short time. One of these properties is known as the Anderson, and another as the Camp, while the James, owned by J. H. James, is a third. In what is known as the "Sixty-three-eleven" group of properties, which lie near the newly located town of Sellwood, and which will probably give its name to the district, are some fine deposits. On sections 29 and 30, 63 11, and on section 25, 63–12, there exists what is probably the most extensive deposit of ore ever known to have been concentrated on so small an area of land. These properties are known far and wide through the famous contests on the property, which is recognized generally as the Eaton & Merritt claim, or as the Hyde and the McDonald forties. The contest for the possession of all these properties is one of the hardest fought legal battles known in the history of the general land office, and it may drag on for some time yet, though on some of the locations there are indications that a possible settlement of the titles is not very far off. Should these titles be settled this winter, as they may be, these mines would at once spring into prominence as producers. The Iron Range Road would be extended to Sellwood and the mines, and they could be made to ship from 300,000 to 500,000 tons the first year of their working. The ore is of a very high grade Bessemer, and it lies near the surface, which means for them cheap development and an extensive output as soon as mining begins. On the Hyde forty, in section 30, there is a deposit of ore over 100 feet in width, within from 2 to 5 feet of the surface. On the McDonald forty the outcrop extends 600 or 700 feet in length. A very fine prospect has been developed in lot 4, section 29. These properties show a succession of lenses about a mile and a half in length. On section 30, 62–14, near Tower, very encouraging prospects have been developed by the Chandler Iron Company.

The latest reports indicate a very large deposit of ore there and this mine will probably be a shipper in a very short time. On adjoining sections several other properties are developed enough to show prospects for good results. In sections 7 and 8, township 62, range 14, some of the best outcrops yet discovered have been found. The title to this property is in litigation. On its settlement the mine will speedily become a large shipper. Besides these properties mentioned there are several others, notably the McComber, in township 62, range 14, with still others scattered throughout the range, which are very rich in ore and are only awaiting the capital necessary to their development to make them large producers. One of the chief drawbacks—indeed it may be said to be the chief—of the Vermilion range is the unsettled condition of titles. With a settlement of the contests now going on the yearly output would quickly be increased to the figures given above, 4,000,000 tons a year. While the other producing ranges of the country will continue to send out great amounts of ore, the output of the Vermilion can be increased indefinitely, for the ore is so much better quality than other ores that it can always find a market. The question of a market does not trouble the present producers, and it will not be a drawback to the mines to be opened in the future if they are of the same quality of ores as those now in operation, and the developments already carried on show that they will be.

A well-known mining expert and one who is continually developing properties on the range, says: 'There is no better opportunity for the investment of capital than on the Vermilion mining range. Its riches are assured, and it has so many advantages over other ranges, that it ought to attract far more attention than it does. In the other mining districts of the Lake Superior region, the cost of mining is yearly on the increase as a lower depth is reached, the ore also shows an increase of phosphorus. This is especially true of the Marquette and Menominee ranges. There are few Bessemer producing mines of those ranges as compared with the number a few years ago, and the reason is deep mining. Among the special advantages the Vermilion will have until it reaches a corresponding depth with the Marquette, should the same thing prove true here, is the fact that it has a leeway of at least 15 years before coming to the position of the mines of this range and those of the Menominee to-day, and that other fact, of cheaper mining.'

The only road at present running into the Vermilion country is the Duluth and Iron Range, which has its ore docks at Two Harbors and whose line goes to Ely, to the Chandler Mine. It is owned by the same syndicate which controls the Minnesota Iron Company and which forms the new Minnesota Steamship Company. It is not run in the interest of the iron company, however, as the owners have always shown a disposition to encourage the development of the range, and will keep the facilities of the road equal to the demands of the whole district. It will make extensions to new properties where the developments indicate that the mines are good ones, and the same rates are given to outside shippers of ore as to the Minnesota Mine. These rates are as liberal and as low as those of other roads in the mining districts of the Lake Superior country.

There is talk of another road to the iron country, starting from Duluth, and while there is nothing known as to the truth of the rumor, other companies will doubtless be tempted by the riches of the range to build into it. With the expected developments of the country, ore carrying enough will be had to support two or more roads of the same character as the Iron Range.

Little is as yet known of the extreme eastern or the extreme western part of the Vermilion, though what is said to be very valuable deposits have been found in both sections. In the eastern end are one or two excellent properties, and there was report that the Hooker location, near Gun Flint Lake, close to the Canadian border, would soon be developed. Work will certainly be done there as soon as railroad facilities are forthcoming. It is expected that the building of the Port Arthur, Duluth and Western will give these facilities. The range extends for quite a distance across the Canadian boundary, and large quantities of iron lands have been purchased here by American capitalists Some time during the past year the Minnesota Exploration Company bought a lot of these lands. On the extreme western end of the range, in Itasca County, the developments indicate the most valuable deposits. Work on what is known as the Griffin mine, which lies about ten miles off the main line of the completed line of the Duluth and Winnipeg road, has been carried on for some time, and it is said that a spur track will be built to this mine and that it will become a shipper next year. Not much can be learned here as to the extent or the character of these deposits.

South of the Vermilion and much nearer to Duluth is the Mesabi range, which has a soft ore but said to be of a fine Bessemer quality. The deposits of iron here have been known for years, and several companies have been formed with the purpose of developments on the range, but up to the present year little has been done. This season quite a good deal of work has been done by one or two parties or syndicates. Colonel Geggie, of Duluth, has a very fine property there, and it would not be far out of the way to predict that it will soon be shipping ore. He has just secured the first one of the State mineral leases on State lands on a tract which adjoins the lands he has been working. John Mallman has done considerable work in development on property near Mesabi, only a mile distant from the logging road of Williston, Charnley & Co., which is a standard gauge, and but five miles from the Iron Range main line. Mr. Mallmann says he will ship some ore next season.

The recent decision of Auditor Braden to lease the State mineral lands under the law passed by the legislature last winter will materially help the development of the Mesabi and of the Vermilion too. Quite a number of leases have been secured already by parties interested in iron lands and mining. Collector Moore and W. T. Bailey and others have leased a good tract of land, and will push developments next season."

During the year 1889 the Connellsville coke operators marketed 326,220 cars of coke, aggregating 5,825,000 tons. A large portion of this immense out-put, the greatest in the history of the region, was sold at prices near the dollar mark, yet the average price of the total output was about $1.40 per ton, at which rate the spot value of the yearly out-put would be about $8,150,000. The output for 1888 was in round numbers 5,000,000 tons, of the average value of $1.20, making a total value of $6,000,000. These figures show a decided increase in trade during the past year. The trade for 1890 opens very conservatively, but another prosperous year is anticipated.

SHOP NOTES.

MACHINE FOR MILLING GEAR BLANKS.

The Pratt & Whitney Company, of Hartford, Conn., have completed all experimental work and perfected a machine which is decidedly simple in construction and yet performs the work it was intended for more rapidly than is possible under the old way. Cast gears when received from the foundry are usually faced up in a lathe and the edges turned down. While the machine now designed to do this work will perform it no more accurately than will the lathe, provided the latter is handled by a true mechanic, it will do the work so rapidly as to displace at least five lathes. After being trued, of course the casting goes to the gear-cutter.

The new machine is founded upon the milling machine principle. The casting to be faced and trimmed is, after having been bored, mounted upon an arbor, which by means of suitable gearing is given the needed speed of revolution toward the cutter. The cutter proper is a many-toothed milling wheel, shaped like the letter H, the central portion of course being much larger than indicated by the letter. The central portion and the inner portions of the two end pieces of the cutter are formed as cutting blades. The width between the side cutting blades is just that desired to produce a gear of the width of face wanted. This cutter is mounted upon a shaft driven by gearing, so

Boring Tool.

connected that one belt from a cone pulley drives both the gear blank and the cutter. The latter also has a movement to and away from the gear in order to facilitate adjustment. It is evident that the wheels turned out by the use of this machine are absolutely alike as regards diameter and width of face, and that the cutting takes place much more rapidly than is possible with the single tool of the lathe.

In the experimental machine which is now at work in the Pratt & Whitney shops the gear and cutter are driven by independent belts from the main shaft. This has been changed in the design of a perfected machine, the reason, of course, being that the slipping of the belt on the cutter, while that driving the gear continued its motion, would be decidedly apt to break or wreck the machine, and therefore in the perfected machine one driving-belt operates both gear and cutter.

STOREHOUSE OR SHIPPING DEPARTMENT.

The storehouse or shipping department of the Pratt & Whitney works, located on the lower floor of the new building, possesses many features not often found in quarters devoted to this purpose and which are intended to facilitate the easy handling of the heavy weights. Entering through the door is a track, also used as a wagon road, which, as the floor is raised some 3 or 4 feet above the grade of the street, brings the floor of the car or of the truck about on a level with the floor of the room. Extending across this room, or at right angles to the car-track, are overhead tracks, upon which runs a truck, provided with a hoisting-gear. At right angles to these tracks and extending to the elevator placed against the rear wall of the building is another track upon which the same hoisting apparatus may be shifted. It is evident from this that a load from any part of the room may be taken by the traveling-hoist, carried either to the elevator or loaded upon a car or truck standing in the roadway.

The upper floors of this building are also provided with overhead tracks, by means of which heavy weights can be carried to and from the elevator. That portion of the lower part of the floor of the elevator nearest the interior of the building is so extended that the hoisting truck can be moved over it so as to deposit its load directly on the elevator.

BORING LONG HOLES THROUGH SOLID METAL.

In the gun department of the same works it is not unusual to bore holes from the solid up to between 3 and 4 inches in diameter and several feet in length. In the manufacture of the Hotchkiss gun the blank tube is finished, as far as its bore is concerned, by four operations. The first tool bores a hole from the solid clear through the blank, leaving only material enough to be taken out by the following tools sufficient to provide the necessary fine finish. The other tools finish the surface and cut and finish the grooves of the rifling.

The tool doing the first boring is formed at its end, which constitutes of course the cutting part of the tool, with steps, as shown in the accompanying rough drawing. The object of stepping the cutting end in this manner is to reduce the width of the chip so that it will pass freely through an angular groove made in the side of the tool and out at its opposite end. One side of the tool is provided with a recess, A, which is formed by cutting a rectangular groove, which is then covered by a cap piece, as is shown in the cross sectional view. This forms a hole along one side of the tool. The other side of the tool is cut away into a very obtuse V shape, B which extends from the cutting head back the entire length of the tool as does the other channel. By means of a pump, oil is forced through the rectangular hole down to the apex of the tool, when it flows back through the angular groove, carrying with it the chips cut by the stepped edges of the cone. This has been found in practice to work admirably, no clogging of the chips causing any inconvenience whatever.

The following cable dispatch from London, England, appeared in the daily papers of the 10th inst.: "The limited liability company formed by the British syndicate which bought up the business of Fraser & Chalmers, of Chicago, has issued £525,000 of ordinary stock and £250,000 6 per cent. mortgage debentures." Fraser & Chalmers being among the largest manufacturers of mining machinery in the world, the dispatch naturally created a sensation in Chicago business circles. A member of the firm was interviewed on the subject and made the following explanation: "The truth is we have recently associated with us some English capitalists for the purpose of enlarging the business and extending it into England and other European countries. There will be two plants, both of which will be erected at once. One will be in Chicago and will cost upward of $1,000,000, and the other will be in England and will cost a somewhat larger sum. At both plants only high-grade mining-machinery, engines and boilers will be made. The investment of the members of the firm of Fraser & Chalmers will be increased so that the partners will still have the management of the business here as well as the general management of that in England. That doesn't look as if we had sold out to English capitalists."

A new cotton mill just commenced at Florence, Ala., it is said, will be the largest in the South.

THE WEEK.

The New York Coffee Exchange decide to erect a new building on Pearl and Beaver streets. Sales on the Exchange last year comprised about 15,000,000 bags, a decline of nearly 25 per cent. compared with 1888.

The shipments of coal from Pittsburgh by the Ohio river in 1889 dropped to 68,255,000 bushels as compared with 109,652,000 bushels in the year 1888, showing the effect of miners' strike.

A single wood-pulp concern in this country, with mills in 24 different States, pays annually $10,000,000 for labor, which represents 80 per cent. of the entire cost of the product.

A decision of the United States Supreme Court in the Edelhoff silk ribbon suit necessitates the refunding to importers of over $6,000,000 excessive duties heretofore collected. The importers will credit themselves with about half this sum clear profit. The decision has a still further significance from the fact that another class of goods known as hatters' satins, also ribbons and velvets are believed to come properly within its scope, involving still larger sums that are liable to be refunded.

At the fifth annual meeting of the Hebrew Technical Institute in Stuyvesant street, held on the 12th inst., the principal, Henry M. Leipziger, read a report most of which advocated manual-training schools. There are at present 120 pupils in the institute, or 20 more than last year. The number of graduates is about 12 each year, and employers of graduates have highly commended the thoroughness of their training. It was proposed at the meeting to build an addition to the school next spring, to be used as a night school for adults who wish to learn a trade. The money is available and the addition will undoubtedly be begun soon. James H. Hoffman was elected president.

The Maritime Labor Exchange hope to inaugurate a strike in New York on April 1, similar to that of the dock laborers in London if their demands are not complied with. The Maritime Exchange has already refused to recognize the demands of the Seamen's Union. It was reported that a special dispatch has been sent to London, Liverpool, Australia and California, asking for the financial and moral support of the unions there in case of a strike in this port. A telegram was also sent to the English branch of the International Union asking that a strike be ordered on the piers of the National Steamship Line in London and Liverpool simultaneously with the one in this port.

The assessed valuation of real estate in New York city is now about $1,400,000,000, as shown by the tax books just completed. The increase for the year is $68,000,000, which is the largest increase recorded in many years. Last year the net increase was about $28,000,000.

The eighth explosion of accumulated gas in the electrical subways took place on Saturday evening in Fourteenth street, near Sixth avenue, tearing up the pavement for 50 feet. Many persons had a narrow escape.

The city of Seattle, in the new State of Washington, has recovered from the disastrous fire of last June with amazing rapidity. There are to-day more brick blocks finished than were in Seattle before the fire, and before the year has closed the burnt district will be covered with brick and stone buildings of massive appearance.

The Florida Orange Growers' Union are endeavoring to concentrate their trade in New York and Chicago, where they will dispose of their product at auction. Statistics given by J. C. McKibben, the president, show the rapid growth of this industry: There are in the State about 10,000 growers. The acreage is 100,000, and the capital invested is from $60,000,000 to $75,000,000. Three seasons ago there were produced 1,250,000 boxes; two seasons ago 2,100,000, and last season about 2,500,000 boxes. We estimate that the crop of 1890 will be over 4,000,000 boxes. From this it will be seen that the orange industry in Florida has steadily increased and is still increasing. This, of course, has had a marked effect on the orange trade of the United States and its influence is shown in the steady decrease of foreign oranges brought to our markets. In 1887 there were imported 1,620,000 boxes and 127,000 cases of foreign oranges; in 1888, 1,150,000 boxes and 154,000 cases; in 1889, 1,100,000 boxes and 180,000 cases.

It has been openly charged that the Commissioner of Public Works, Mr. Gilroy, so framed his contracts for asphalt pavements that competition with those who control the asphalt beds in Trinidad is impossible. The Commissioner says in self-vindication that all specifications require that asphalt shall be "of a quality to be approved by the Commissioner of Public Works," thus allowing the largest possible competition by contractors.

The iron viaduct at Macomb's Dam Bridge to supply water for Washington Heights will be 1500 feet long and 60 feet wide, and the estimated cost is $503,000.

The Sugar Trust seems to have become hopelessly involved in litigation. It was lately understood that the purpose of its managers was to obtain a charter as an incorporation under the laws of Connecticut, but it was believed that no attempt would be made at any conversion scheme pending the action of the Court of Appeals upon the case now before it—the case decided against the trust originally by Judge Barrett, whose decision has since been confirmed by the General Term, by which the trust has been held to be "a criminal enterprise." There was some surprise, therefore, when it was announced in Wall street on Thursday, that Judge Ingraham had issued a formal injunction to restrain the trust from making a conversion, it being alleged that proceedings looking to that end were now actively under way. It was also ordered that no more moneys be paid out in dividends pending the decision by the Court of Appeals. The effect of this action was seen in the immediate fall of Trust stock to 51⅛, the lowest price it ever touched, indicating a shrinkage of $37,500,000 from the recent market value of $62,500,000.

The official statement of the arrival of steam-ship passengers at this port last year shows the increase of travel caused by the Paris Exposition. The total number landed was 411,913, of whom 315,227 were in the steerage. The North German Lloyd carried more than any other. While the number in the steerage decreased 68,000 compared with 1888, there was an increase of 10,384 in the number of saloon passengers.

New York capitalists are about to establish a line of steamers to St. John via ports in Maine. While two new steamers are building chartered vessels will be employed. Thomas M. Bartlett is president of the company.

The menhaden oil fisheries now employ 46 steamers, besides sailing vessels, and produced last year 3,350,000 gallons of oil. The capital in the business is $2,500,000.

James C. Bayles, ex-president of the Board of Health, recommends that the Mayor and heads of departments should constitute the executive officers of the street-cleaning board, an effective administration of the duties of the office of Street Commissioner being impossible under the present system.

The Lake Carriers' Association, S. D. Caldwell, president, oppose building a bridge at Detroit.

The two Hamburg-American Steamship companies are charged by the Austrian Government with encouraging emigration to the United States.

John C. Paige, the insurance expert, says the total losses, including insurance losses, by Boston's Thanksgiving Day fire will not exceed $4,000,000.

The New York milk producers, to avoid the alleged extortion of middlemen, have decided to form a stock corporation and open depots in New York City, delivering their milk directly to the consumers.

England has a fleet of 15 unarmored steam cruisers with 76 guns *en route* for Zanzibar waters to protect British interests from the alleged aggressions of the Portuguese authorities in Eastern Africa. At last accounts the Portuguese had conceded all demands and a peaceful settlement was expected.

Mayor Chapin, of Brooklyn, in his message urges that a second bridge to New York City should be built, to afford increased facilities for travel. An additional bridge will soon become a peremptory requirement, and later a third will follow.

Minneapolis seriously contemplates building a canal from the "Flour City" to Duluth, at the head of Lake Superior, thus securing direct water communication with the Atlantic coast, and it is said that Congress will be asked to appropriate $5,000,000 or $6,000,000 for this object. The chief end to be subserved in the accomplishment of this great work, is to overcome the difficulties which now oppose the increase of the large manufacturing interests at this point. The distance to be covered is about 150 miles.

The Supreme Court decides that Gen. James C. Duane, Chief of Engineers, U. S. A., retired, was eligible for aqueduct commissioner, not being an office-holder and on that account disqualified. There is a distinction between an officer and an office-holder.

Admiral Schufeldt, who consummated the first independent treaty with Corea, in June, 1882, expresses fear that the king, who has long been harassed by the Chinese viceroy, will at length abdicate his sovereignty, and intimates that the protest of the United States alone can prevent Corea's absorption in the Chinese empire. All the customs revenues of Corea already pass directly into the hands of the Chinese authorities and the imperial treasury is so much impoverished that it is difficult to pay promptly the salaries of the American officers employed to reorganize the Corean army.

A survey of the agricultural products of the country for the past few years, one year being compared with another, with reference to quantity and values, leads to the conclusion that present prices are on the whole about the lowest ever known for January. It may be added that prices of farm products have never at any season been quite as low as they are now, even though some varieties were not in full supply last fall and are dearer than usual. Prices of manufactured and imported products are relatively higher than in July last or January last. But farm products, as a whole, are at the lowest price yet reached at New York, and although cost of transportation is low, the returns to the farmer per bushel or pound must evidently be unusually small.

MANUFACTURING.

Iron and Steel.

The Keystone Bridge Company, of Pittsburgh, have some important contracts on hand. They have recently shipped a roundhouse for a South American Company to be erected at Rio Janeiro. The material is mostly Bessemer steel, and was made at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa. The company have a contract for the bridge which will be erected over the Missouri River at Kansas City by the Kansas City and Terminal Street Railway Company.

On the night of the 8th inst., No. 1 turn at the Edgar Thomson Steel Works of Carnegie Brothers & Co., Limited, at Braddock, Pa., turned out 2525 rails in eight hours. This is the largest output on record in the same length of time, the next highest being 2228 rails.

The Pottstown Iron Company, of Pottstown, Pa., have advanced the wages of their puddlers from $3.50 to $3.75 per ton. All four of the iron manufacturing firms at that place are now paying $3.75 per ton for puddling.

The report of Fayette Brown, receiver for Brown, Bonnell & Co., of Youngstown, for the month of November, is as follows: Amount on hand November 1, $12,856.68; receipts during November, $250,804.10; total, $263,660.78. Disbursed, $253,880,20; on hand November 30, $9,772.58.

The Ironton Rolling Mill Company have leased the New York and Ohio Iron and Steel Company's Rolling Mill plant at Ironton, Ohio. They will have the large jobbing sheet mill contained in it ready for operation by the 15th inst. and will manufacture sheets, fire-bed and tank-iron and steel, up to 40 inches wide by 144 inches long. J. H. Moulton is president and C. M. Buchanan secretary and treasurer.

The Cambridge Iron and Steel Company, Cambridge, Ohio, have contracted with the Alex Laughlin Company, of Cleveland, for a regenerative gas furnace, with working hearth 7 x 14 feet, with the gas-producers necessary to operate the same, which will be used for heating piles for their bar mill. The producers will be equipped with the vertical sand-dampers, for which a patent was recently granted the Laughlin Company, and the checker-work of the furnace will be composed of silica brick exclusively, which this firm have adopted as their standard for this purpose after a thorough test of them in comparison with clay brick.

The Illinois Steel Company have adopted the Massick & Crooke type of fire-brick hot-blast stoves for the four new blast furnaces which they are erecting at their South Chicago works. These furnaces are each 21 x 85 feet, and each will be equipped with four stoves 22 x 70 feet, giving 30,000 square feet of heating surface to a stove. The blast furnaces at their Union works, which were remodeled the past summer, are doing better than ever before in their history, and are creditably sustaining the reputation of the Chicago blast furnaces.

The Vulcan Forge and Iron Works of Long & Co., at Chartiers, Pittsburgh, were sold at sheriff's sale on Friday, the 10th inst,, to J. E. McKelvey for $100,000. There is a mortgage of $75,000 on the plant and about $8000 are due the employees for wages, which will increase the purchase price to a little over $183,000. The purchase includes the plant complete, about 9 acres of ground, all buildings and machinery. Long & Co. in their property account listed the plant at $396,000, as it cost the firm that much, and competent judges say that the mill was worth $250,000. For this reason the syndicate that secured the property through Mr. McKelvey consider that they got a bargain. It is stated that Charles Lockhart, a well-known capitalist of Pittsburgh and prominently connected with the Standard Oil Company, is at the head of this syndicate. Mr. Lockhart has made the statement that the new owners will put the mill in operation as soon as possible.

The Carbon Iron Pipe Company, of Parryville, Pa., under the management of H. J. Seaman, are relining their large No. 3 furnace and are making some changes in the stoves. It is expected that it will be in blast next month. This will put all the furnaces of the company into operation.

The Iowa Barb Wire Company, of Allentown, Pa., have let contracts for additional annealers which will increase the capacity of their wire mill to 100 tons per day.

Gordon, Strobel & Laureau, Limited, of Philadelphia, have contracted with the Southern Iron Company, of Nashville, Tenn., for two 16 by 55 Gordon fire-brick stoves to be erected at their West Nashville furnace.

The Peoria Rolling-Mill Company, of Peoria, Ill., recently incorporated with a capital of $200,000, have elected the following directors: Charles P. King, W. H. Binnian, E. F. Baldwin, Benj. Warren, Jr., R. C. Flower, H. C. Carrick, A. E. Scott, A. H. Flower, C. H. Mosher, J. S. Manfull and Wm. Jack. They have chosen as officers Charles P. King, president; H. C. Carrick, vice-president, C. H. Mosher, secretary, and R. C. Flower, treasurer. The manager of the mill will be Thomas Gogin, formerly and for many years manager of the Norway Iron and Steel Works, of Boston, whose plant has been purchased and will be removed to Peoria by the company above named. The reconstructed plant will be composed of four double puddling furnaces, seven heating furnaces, two 8-inch, two 10-inch and two 18-inch trains of rolls and one 2½-ton hammer. Merchant bar-iron and hoops will be manufactured.

The Waugh Steel Works, of Belleville, Ill., with a capital of $300,000 and employing 300 hands, have had a very prosperous year. Sales of their leading specialty, light rails running from 12 to 40 pounds, have largely increased in all parts of the country—from California eastward and from Texas and Louisiana northward. Their nail plant has not been restarted, owing to the interruption occasioned by making great changes and improvements in machinery. The company have changed the nail-plate train and put in a larger engine, a 34 x 60 Ranken & Fritsch Corliss, so as to roll heavier material, and also nail plate as well. Their coal is drawn from a mine only three-fourths of a mile away, and is dumped into the mill-bins direct from the boxes in which it is loaded in the pit. The pay roll aggregates $8000 a fortnight and $14,000 when the nail factory is running.

The Valley Steel Company, the recently incorporated purchasers of the Western Nail Works, at Belleville, Ill., have restarted the plant. Soft steel in the form of billets, nail-plate, &c., will be rolled and the nail factory also operated. The new enterprise will furnish all the rolled material required by the Tudor Iron Works, with which it is intimately connected, besides caring for the general trade.

The Carp River Furnace Company are making satisfactory progress in rebuilding their furnace at Marquette, Mich. The new stockhouse will hold 10,000 tons of ore and is already receiving shipments of Negaunee ore. The charcoal shed is 50 by 150 feet and contains a considerable quantity of fuel. Manager Burt expects to be able to blow in by February 1.

Carnegie, Phipps & Co., Limited, of Pittsburgh, are remodeling the rod mill department of their Beaver Falls Mills, with a view of increasing its capacity. The engines will develop 2500 horse-power and are being built by William Tod & Co., of Youngstown, Ohio.

The plant of the Lawrence Iron and Steel Company, at Ironton, Ohio, was in operation 243 days and 158 nights in 1889, during which time 8699 tons of finished iron were turned out. This is a decrease on the 1888 product which was 10,674 tons.

On the 7th inst. a contract was awarded to the Linden Steel Company, Limited, of Pittsburgh, for finishing 861 tons of protective deck plating for the new battleship Texas at 6.9 cents per pound, amounting to $102,165.

The Latrobe Steel Works, at Latrobe, Pa., will shortly commence the erection of an additional open-hearth furnace and another tire-mill. William Tod & Co., of Youngstown, Ohio, are building the tire-mill engines, which will develop about 2500 horse-power, and will be duplicates of those illustrated in *The Iron Age* at the time the Latrobe Steel Works were put in operation.

Extensive improvements are being made at Port Oram Furnace, at Port Oram, N. J. The stack, which was 60 feet high, is being built up to 75 feet, and three new hot-blast stoves and an I. P. Morris engine are being added to the equipment.

The Montreal Rolling Mills Company, of Montreal, Canada, have been running their new 12-inch mill, built by S. T. Williams & Co., on skelp iron for pipe successfully. They intend at an early date to start the manufacture of bar iron up to 2-inch, rounds and squares.

At a meeting of the Board of Directors of the Laughlin Nail Company, held at Wheeling, W. Va., on the 4th inst., a dividend of 6 per cent. out of the earnings of the past year was declared. The company have under consideration the question of erecting a blast furnace, but have arrived at no decision in the matter as yet.

No. 1 furnace, of the Pennsylvania Steel Company, at Steelton, Pa., after being thoroughly repaired and relined, was put in blast on Saturday, the 4th inst. No. 3 furnace, of this company, produced more iron during the month of December last than ever before in a similar period in its history.

Announcement is made that the erection of a new rolling mill will shortly be commenced at Catasauqua, Pa. It will be under the management of Wm. P. Hopkins, for many years connected with the Catasauqua Mfg. Company as superintendent. The main building will be 70 feet wide, 340 feet long and 23 feet clear. The plant will have 13 puddling, 2 scrap and 2 heating furnaces, with a capacity of about 1000 tons of guide and merchant iron per month, and will give employment to more than 200 men. The style of the iron firm will be Hopkins & Co. Estimates are now being secured for the new mill, which is expected to be completed in four months after ground is broken.

Some extensive improvements are being made at the plant of the Clinton Iron and Steel Company, located in the West End, Pittsburgh. These improvements include the erection of seven new puddling furnaces and a battery of boilers. The old Clinton Blast Furnace of this company is being torn down and in its place will be

erected a new furnace, which will be built in the latest modern style and is expected to produce about 150 tons per day when completed.

Northampton Furnace, situated at Freemansburg, Pa., and owned by the Bethlehem Iron Company, of Bethlehem, Pa., was put in operation on Wednesday, the 8th inst. It has been relined and repaired.

William Clark's Son & Co., proprietors of the Solar Iron Works, at Pittsburgh, are making some important improvements and additions. A new 30-ton Siemens-Martin open-hearth steel furnace is being erected, and will be completed at an early date. The furnace will be built entirely of silica brick, and is being erected separate from the other open-hearth plant, which will necessitate the erection of a hydraulic crane, pumps, ladle crane and molds. The entire cost of the work will be about $15,000.

The nail factory of the Belfont Iron Works Company, of Ironton, Ohio, was in operation about 250 days during 1889, and during that time produced 207,392 kegs of nails. The nail factory of the Kelly Nail and Iron Company was in operation about the same length of time and turned out about 140,000 kegs of nails.

The plant of the Keystone Smelting Company, located at Pittsburgh, has been purchased by Grant McCargo and C. E. Dixon, who took possession last week. The new firm intends to largely improve the plant.

A very serious accident, accompanied with loss of life, occurred at Lucy Furnace No. 1, of Carnegie, Phipps & Co., Limited, located at Pittsburgh, last week. The furnace had not been working well and was undergoing repairs. After these had been completed and the furnace charged the furnace boss gave orders to slack the furnace. During that time a great quantity of gas had accumulated in the bosh. When blast was turned on the accumulated gas ignited and an explosion followed. One man was killed and five others were seriously injured. The furnace was not damaged to any great extent and is now in operation.

An accident occurred on the 11th inst. at the Union Works of the Illinois Steel Company, which might have been very serious. As it is, one man may die and two will be disabled for some time. A converter was about to be emptied of 10 tons of steel when one of its supports gave way and the contents poured into the pit, from which all of the workmen were not able to get out in time to save themselves. It is fortunate that so few were injured.

Machinery.

The Robinson-Rea Mfg. Company, of Pittsburgh, have had a very prosperous trade during the past year. In addition to a large amount of general work on hand they are at present building the two blowing engines for the Roanoke Iron Company, of Roanoke, Va., as already noted in these columns. The blast cylinders of the engines are 84 inches in diameter and the steam cylinders 42 inches, and 5-foot stroke. They have just shipped a 24-inch sheet mill to the Apollo Iron and Steel Company, at Apollo, Pa., and are about to ship a 22-inch muck mill to the same company, also a full complement of rolls to the Phœnix Iron Company, of Phœnixville, Pa. These rolls are all finished and ready to be put in the mill.

Capital Mfg. Company, Rees street, near Halstead, Chicago, have issued the following notice of removal: "We take pleasure in notifying our patrons and friends that we have removed to our new factory on Rees street, near Halstead street, and kindly ask that all letters be addressed as above. Owing to the large increase in the demand for our goods we have abandoned our old plant and erected a new factory especially adapted to our business, and thereby greatly increasing our facilities. Our new factory is very conveniently located; we have a four-story building, 125 feet square, with a basement 16 feet high, the second floor 14 feet and the other floors 12 feet high. New machinery has been added and old machinery replaced by the modern appliances, and hereafter we will be able to meet promptly the constantly growing demand for our goods.

William Tod & Co., of Youngstown, Ohio, are building the blowing engines for three of the new blast furnaces now being erected in Virginia and Alabama. They are all of the design illustrated in *The Iron Age* some months since and orginally made for the Shenandoah Furnace Company.

The Salem Foundry and Machine Shop, Salem, Mass., builders of elevators, report the following recent sales: Samuel W. Duncan, Haverhill; Jennings, Friedman & Stevens, Haverhill; Naumkeag Steam Cotton Company, Salem, (2); Winslow & Rogers, Beverly, and Pocasset Mfg. Company, Fall River, (2).

The Jeffrey Mfg. Company, of Columbus, Ohio, manufacturers of detachable and roller chain belting and mining machinery, report a very heavy business in all of their different lines. They have just placed in the hands of the printers a large and complete new catalogue.

The National Pulley Covering Company, of Baltimore, have recently completed arrangements with Ellett & Cooke, Richmond, Va., for the exclusive sale of their goods in Virginia and North Carolina, to whom all inquiries from that section should be sent

S. L. Schoonmaker the well-known coke operator, of Pittsburgh has contracted with J. & J. B. Milholland, of that city, for one of their direct-action haulage engines for one of his mines in the Connellsville district. This plant is to operate the works known as the Youngstown Coke Company's works, near Uniontown, Pa. The cylinders are to be 18 inches in diameter and 40 inches stroke, made in the most modern manner, and to have drum capacity to haul their coal out of the mines, a distance of one mile. The size of rope to be used is ¾ inch in diameter. This plant is the fifth pair of haulage engines Mr. Schoonmaker has bought from this firm. In connection with these engines there are to be used two 100 horse-power return tubular boilers. The entire plant is to be fitted out with all the firm's latest appliances and improvements.

Hardware.

W. B. Hollis & Sons, who recently purchased the plant and appurtenances of the Hollis Tack and Nail Company, located on the South Side, Pittsburgh, contemplate a large addition to the capacity of the existing plant. They will shortly add a complete equipment of machinery to manufacture wire nails from a large boat-spike to the smallest wire finishing nail known to the trade. They will also manufacture pipe-hooks, double-pointed tacks and a number of specialties in wire goods.

St. Louis Dripping Pan Company, St. Louis, Mo., have recently added some new machinery to their plant and advise us they are now in a position to take orders for prompt shipment. They make 32 sizes, from 6 x 9 to 18 x 19.

After an idleness of two months the Lenz Wire Nail Company are starting up their factory at Belleville, Ill. Sixteen machines will be run and everything on the wire-nail list will be made, from ½-inch up to a 6-inch spike.

Hollow Cable Mfg. Company, Hornellsville, N. Y., started up their works January 13 and are running 23 out of 24 hours. They have also put in an electric-light plant. The demand for their goods is large.

It is stated that the new manufactory of the National Screw and Tack Company in a fine large building on the Cleveland and Pittsburgh Railroad, at Stanton street, Cleveland, Ohio, will be ready for the beginning of operations in about ten days. It is equipped with machinery of the most recent design and will employ about 200 men at the start. The company's office is at present located in a frame building at East Prospect street and the Cleveland and Pittsburgh road.

The Cronk Hanger Company, Elmira, N. Y., are putting in new machinery which will double their capacity on Hangers and Track, as well as Wire-Cutters.

The Dimon & Johnston Mfg. Company, of Denver, Col., are at present closing a contract to equip a 2000 gross per day wood-screw plant for St. Louis with their improved shavers and threaders. Mr. Johnston, who superintends this branch of the business, was for 12 years in charge of the wood-screw manufacturing department of the Russell & Erwin Mfg. Company, and is a well-known expert in this line. The new threaders now building will point and thread 14 1-inch No. 10 screws per minute, or over 58 gross in ten hours. All the other sizes are made in the same proportion.

Hubbard & Co., the well-known axe manufacturers, of Pittsburgh, whose works were destroyed by fire about six months ago, have just completed the erection of a new manufactory which was put in operation last week. Nothing but shovels and hoes will be made in the new works, the company having decided to manufacture axes exclusively at their other works located at Beaver Falls, Pa. About 100 men are employed in the Pittsburgh works, but when in full operation a considerably larger number will be given employment.

Miscellaneous.

The Chicago Belting Company have established their quarters in the new brick block recently erected on the southeast corner of Randolph and Canal streets, Chicago. The machinery is rapidly being received and installed. Leather belts will be manufactured, but the company will also deal in mill supplies. James Moloney, the president of the company, has had long experience as a practical belt manufacturer. J. M. Thomas is secretary and treasurer.

The Wainwright Mfg. Company of Massachusetts, have furnished the following electric plants with their corrugated copper tube feed-water heaters recently: Canada Electric Light Company, Nova Scotia, 100 horse-power; Edison Electric Light Company, Pennsylvania, 300 horse-power; No. Attleboro Steam and Electric Company, Massachusetts, 250 horse-power; Marr Construction Company, Massachusetts, 150 horse-power; Lewiston Electric Light and Heating Company, Illinois, 75 horse-power; Belfast Electric Light Company, Maine, 100 horse-power; Denver Tramway Company, Colorado, 400 horse-power; Greensburg Electric Light Company, Indiana, 100 horse-power. They report business brisk in heaters, condensers, expansion joints and separators.

Fourteen lives were lost by the rising of water in a caisson being sunk at the foundations of the new bridge across the Ohio river at Louisville.

The Iron Age

New York, Thursday, January 16, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

INDEX TO VOL. XLIV.

The Index for the volume of *The Iron Age* ending with December, 1889, is now ready for distribution and will be supplied to subscribers on application.

Reconciling Employers and Workmen.

Most happily for all interests represented by the various classes of labor in the United States, whether skilled or unskilled, a condition of content prevails throughout the length and breadth of the land such as has not been before experienced for many years. Aside from the unemployed miners of the anthracite coal regions of Pennsylvania, it does not appear in all the wide range of American industries that dissatisfaction exists, unless to an extremely limited extent. By what means or through what influences this auspicious change has been brought about may matter little, unless it be possible to extract therefrom lessons of wisdom. In the retrospect, however, a series of labor struggles is brought to mind, each of them planned on a formidable scale, each bringing into play all the accessories at command as the result of thorough organization. There was at least reasonable assurance that by resolute, unyielding persistence in the course prescribed by the chosen leaders, all impediments to a complete triumph would at length be overcome. But instead of triumph there was disastrous reverse. The cohorts of labor were repulsed again and again. First, there was the conflict on Gould's Missouri and Pacific Railroad system, extending from the Northwest down to the furthest limits of Texas. Then came the great Reading strike, in which locomotive engineers, firemen and miners made common cause against the alleged monopolists. But Austin Corbin, like Gould, was in the end able to dictate the terms of settlement. This result was due, in some measure at least, to alleged treachery within the body of locomotive engineers, some of whom had local grievances to avenge regardless of the common cause. Again the failure of the 'longshoremen's strike in New York was ignominious. The car-drivers, too, were utterly discomfited. With broken ranks and exhausted resources the forces of organized labor retired, and are seen now in detached and discordant bodies.

In England, meanwhile, the labor problem has been pushed to a decisive issue, and it is well to observe the existing phases of a contest of like character, though prosecuted under conditions in some respects widely differing. The dominant idea in that country, seemingly accepted on all sides, is that "condition must be substituted for conflict." This fact appears in the recent action of the London Chamber of Commerce, which has devised and approved of a scheme for the establishment of a permanent committee to deal with questions arising from labor disputes. One of its methods will be to promote the formation of "councils of consideration" among the various trades, to be composed of employers and workmen. This feature, it pleases the London *Times* heartily to commend, more especially since a system of this character, as established in the north of England, is productive of excellent results. The *Times* says:

> There is no self-appointed committee intervening on grounds of general benevolence between employers and employed in their disputes, but a properly constituted representative board, on which employers and employed are equally represented. The awards of this board are determined by vote of the delegates after duly considering such representations from both sides as are placed before them orally or in writing, and in case of an equality of votes the matter is decided by a referee previously appointed by the board. This decision is regarded as binding upon the employers and operatives of all works which are represented on the board. Ordinary questions and individual disputes are determined by a standing committee of the board, but the board itself deals with the question of a general rise or fall of wages or else appoints an arbitrator for the purpose. The arbitrator holds his inquiry in public, hears both parties, and calls for any further evidence that he may require, the evidence and award being subsequently printed and forwarded to every member of the board. Besides this, the board appoints an accountant of high position, who confidentially examines the books of the several firms connected with the board every two months, and as a result of his examination he issues a formal certificate of the average selling price for that period, and this certificate is accepted as authoritative by all parties. The expenses of the board are defrayed by a tax levied *pro rata* on the operatives represented, each firm contributing a sum equal to the total sum contributed by their workmen. This is in outline the system established by the Board of Arbitration and Conciliation for the North of England Manufactured Iron Trade. "It has succeeded," says Mr. Spence Watson, "in developing and maintaining friendly relationship between employers and employed in a trade in which a hostile attitude largely prevailed—a trade which had undergone peculiarly rapid development, and into which there had been a large influx of laborers from Ireland, as well as other parts of England, so that masters and men were strangers one to the other."

It will be observed that the course of procedure here laid down partakes little of that which is sentimental, but rather is eminently practical and business-like—pregnant with timely suggestion.

Liquidations in Railroad Property.

It is stated by the *Railway Age*, which is good authority on the subject, that in 1889 the foreclosure sales of railroads covered double the amount of nominal value of property thus affected in 1888. No less than 25 companies, controlling 2930 miles of road, with a total funded debt and stock of $137,815,000, besides a large amount of unpaid interest and floating debt, were sold out for their creditors in the past year. Such a liquidation in a single interest of the country's general business is enormous, and it would be a serious element of disturbance if the value of the securities involved represented just that amount of the country's wealth. But this is not the case with most of the railroad companies, whose affairs require the intervention of a receiver to adjust the claims of creditors. The bonds issued were placed at a heavy discount from their face value, and the stock was quite frequently a bonus given to those who invested in the bonds. The completed road, however, was expected to earn the full interest on the face value of all the bonds and a comfortable dividend on the stock issued. Railroad securities thus floated were so swollen beyond their cost to investors that it is not remarkable to see the press of financial difficulties hard at work squeezing the water out of them. The record of 1889 in this respect compares as follows with its 13 predecessors:

Summary of Foreclosure Sales for 14 Years.

Year.	Number roads.	Mileage.	Stock and bonds.
1876	30	3,840	$217,848,000
1877	54	3,875	198,984,000
1878	48	3,906	311,631,000
1879	65	4,909	243,288,000
1880	31	3,775	263,882,000
1881	29	2,617	127,923,000
1882	16	867	65,426,000
1883	18	1,354	37,100,000
1884	15	710	23,504,000
1885	22	3,156	278,494,000
1886	45	7,687	374,109,000
1887	31	5,478	328,181,000
1888	19	1,596	64,555,000
1889	25	2,930	137,815,000
Total in 14 years	448	46,700	$2,682,740,000

Nearly 36 per cent. of the present aggregate capital of the railway system of the United States has thus gone under the auctioneer's hammer in 14 years. Surely those who in former times lifted up their voices against the method of financing new railroads and prophesied that the time would come for matters to adjust themselves on a sounder basis have been justified by this remarkable presentation of bankruptcy. The time has passed when more and more stock or more and more bonds can be issued by old roads in the belief that increased earnings will make such a course safe. The sources of the increased earnings must be seen or the pressure of increasing business must be felt.

If these figures were alone to be used, without further inquiry or elucidation, what a lugubrious picture of the condition of business in this country could be drawn? Fancy 36 per cent. of the entire capital invested in any other than railroad business being wiped out in 14 years. Yet this momentous fact seems to have no further effect than to slightly check investments in new enterprises. The heaviest foreclosure sales recorded occurred in the most prosperous periods the country ever saw. From 1878 to 1880, inclusive, the property thus disposed of was enormous, and it was somewhat exceeded in 1885 to 1887, inclusive. Yet these two periods will be recognized as most excellent for general business and at the same time conspicuous for new railroad mileage constructed. The squeezing process thus appears to be more beneficial than otherwise, if current conditions are taken into consideration.

Foreclosures are, however, but the terminal proceedings of railroad bankruptcies in which receiverships mark the beginning. The receiverships designated during the past year cover 22 roads, with 3803 miles of track and $184,366,000 stock and bonds. Thus do the financial mistakes and business mismanagement of the past project themselves into the future. A large crop of foreclosures has been

sown to be reaped this or next year. And the movement will probably go on in - nitely, for there is no immediate prospect of the system of railroad financing being changed. On the other hand there are strong reasons for its continuance which will hardly be eradicated by an occasional failure or foreclosure. The opportunities for profit to promoters or builders are too great.

Power for Isolated Machines.

It seems to be the tendency at the present time to subdivide, or, in other words, to provide each machine with an individual or independent power for driving. Naturally these methods divide themselves, considered from the motive end, into three parts—steam, air and electricity. The advantages to be derived from such subdivision of power are apparent. When a power is used solely for the propulsion of one machine it is under the sole control of the operator using that machine. No matter what system is used, this method does away entirely with all expense, both constructive and operative, connected with the use of shafting and reduces most materially the expense of wear and tear. As an additional advantage, when the machine is used only when needed, all expense ceases when the operator has no further use for that particular machine. The disadvantages are the first cost, wear and tear and the expense of maintenance. In this, of course, it is apparent that whether a steam-engine, an air-motor or an electric-motor be used the first cost is greater as compared with the cost of extending a shafting and driving the machine through the usual belts and pulleys. This, as is evident, militates against the use of an individual driving power for each machine.

Considering the three motors which are possible as individual powers for the driving of isolated machines, steam is out of the question, for several evident reasons. Compressed air has been used with more or less success in Paris, as was recently noted in *The Iron Age*, and yet the advantages to be derived from its use are not equal to the extreme disadvantages arising from the necessary piping peculiar to the machine itself and the deficiency in the power obtained. Doing away, therefore, with the two mediums which are very similar in their operation—steam and compressed air—we find ourselves confined to the electrical motor. As a self-regulating machine this is beyond all doubt the superior of any machine now in the market for the generation of power, for the simple reason that of the power brought to it it will transmit, in the best forms, 92 or 93 per cent. as effective work. Again, it requires no attendance whatever except occasional oiling. In wear and tear it is reduced to mere journal wearing, which may be overcome by proper lubrication and construction of parts, and in attention it requires practically nothing. Further than this, it requires no piping whatever to carry away hurtful gases, for the simple reason that it generates nothing. In point of regulation it is as effective as the best steam-engine governor, because the motor as now built is guaranteed to run within 2 per cent. of the speed regulation provided by the contract. This regulation is independent of any outside influence, as the motor is so constructed that an excess of current will act to decrease the speed, while at the same time an excess of load will act to increase the current, so that the two are counterbalanced within the 2 per cent. mentioned. Another decided advantage in the use of the electric motor is that it is essentially a rotary engine. The power is applied to the development of a rotary motion in contradiction to that applied in the ordinary steam engine as a reciprocating motion, and in consequence there is no lost motion in the engine. The power being applied continually and at all times to the periphery of the wheel obviates those difficulties which have originated in the ordinary steam engine in changing the reciprocating to the rotating motion.

Concerning the efficiency of the electric motor as now constructed, we find that three essential questions affect the result: First, it is necessary to change the power as manifested in steam under pressure to electricity. Then this electricity must be conveyed along a suitable conductor to the motor. Finally, the power so conveyed must be reconverted into power to be expended on the shaft. Taking the power of the steam-engine as 10, we can convert 90 per cent. into the dynamo as electricity. The latter we can convey for short or long distances, as may be necessary, and will lose according to the resistance of the wire a smaller or greater percentage of the initial current generated by the dynamo. Assuming this average loss due to resistance of the conducting wire as 10 per cent., we have delivered to the electric motor some 81 per cent. of the effective power of the engine. The best electric motors as now constructed will deliver in effective work from 90 to 93 per cent. of the electrical power supplied to them through the conductors. We therefore have in work actually performed by the electric motor from 70 to 75 per cent. of the actual work performed by the steam engine, which may be near or far away, and the distance of which governs, as will be understood from the above, the effective work performed by the motor.

It is very evident from this, which is every-day practice, that the electric motor possesses, in a certain sense, decided advantages, when considered in connection with a dynamo and transmitting wire, over any other method of transmitting power from a known source to the point of destination; but it is to be remembered that while the electric motor possesses these advantages in regard to economy, self-regulation and economy of maintenance, it is also evident that it labors under most decided disadvantages. Considered from this aspect, the first and most evident feature is the high speed. An electric motor of 3 or 5 horse-power, placed in an isolated position to run a large lathe or planer requiring this amount of power, must have its initial speed of 1500 or 2000 revolutions of its armature per minute reduced down to the 100 or 125 required by the driving-shaft operating the machine by the introduction of a reducing mechanism. The latter must necessarily be either of the worm or gear pattern. This introduction of quick-revolving parts and of the several parts needed to reduce the motion from the high speed to that of the low speed needed to drive the machine, leads to wear of the parts not only in the motor itself but in the intermedium through which its power is transmitted. The good points of the electric motor are not appreciated as they should be. The electric motor would be more extensively used if its driving-shaft, or, in other words, its armature shaft were reduced in speed. The ordinary mechanic, knowing that he wants only a speed of 50 revolutions a minute to drive his machine, will look with suspicion upon any power which travels at a speed of 1500 revolutions a minute.

Another feature which acts against the introduction of the electric motor in cases where it should apparently be used is the first cost. Considering the horse-power derived from it and the cost of construction, this is unnecessarily high. The influence thus exerted against the adoption of the motor by the manufacturers has done much to retard its introduction. We see no reason to prevent the construction of a low speed, moderate cost, electric motor.

A Contract Void.

Another of the contracts engineered through the Boston Water Board while William A. Simmons was chairman, has come to grief. This time it is the Worthington pump-case, Judge Colt, of the United States Circuit Court, having recently given a decision for the defendant in the case of Charles C. Worthington against the city of Boston. This was the action brought to recover damages for the alleged breach of a contract by which the plaintiffs were to furnish two high-service pumping-engines to the city for $106,575. The city refused to receive the engines on the ground that the Boston Water Board, which was a party to the contract, had no authority to enter into any contract involving more than $10,000 without advertising for proposals, a proceeding neglected in this instance. An ordinance passed by the City Council on March 22, 1876, which was in force until after the contract with the Worthingtons was made, provided that no contract or purchase which is estimated to involve an expenditure of more than $10,000, except a contract for the laying of pipe, shall be made by the Water Board until sealed proposals are advertised for. Judge Colt says in his opinion: "The ground upon which the courts hold that the city has no right to accept a patented article where the law requires a letting to the lowest bidder, is that the law means that there should be a competition among bidders, and that in the case of a patented invention, there is no competition. It is urged by the plaintiffs that by the terms of the ordinance the Water board was not obliged to accept the lowest bidder, and therefore, having determined upon a Worthington pump, it was useless to advertise for bids. However this may be in this particular case, I think it would be a dangerous principle to establish that because one feature of one article, which the city desired, was patented, the Water Board thereby can waive the requirement of advertising and the advantages of publicity, and secretly make their own selection. Even though a thing may be patented, it may form a subject of competition because there may be numerous licenses under the patent. The ground upon which I decide against the plaintiff on this point is, that the ordinance obliged the Water Board to advertise for proposals, and that it was beyond their power to waive or dispense with these requirements, and that therefore the contract which was made, upon which the plaintiffs rely, was void."

Increased Pig Production.

The unprecedented activity among the furnace plants of the country continues. We entered the new year producing pig iron at a rate which beyond all doubt places us in the first rank as manufacturers of pig iron, as we have long been as home consumers thereof. Even since the opening of the month a number of additional furnaces have resumed, some of them after long periods of idleness, and reports continue to come in of others at which preparations are in progress. There is considerable furnace building going on, so that from present indications nearly every month will witness the lighting of new stacks.

As compared with previous months the record stands as follows:

	Furnaces in blast.	Capacity per week.
January 1.	333	174,038
December 1.	328	169,151
November 1.	323	165,225
October 1.	311	151,057
September 1.	294	134,068
August 1.	286	145,899
July 1.	285	141,419
June 1.	286	137,119

The question which probable perplexes the majority in the trade is where this enormous amount of iron goes to. The markets are evidently absorbing it quite rapidly. While there have been some slight evidences of pressure in some grades and in some localities, the general tone of the market has been very strong. The balance between supply and demand does not, therefore, seem to have been distributed, in spite of the enormous development of the former. The inevitable conclusion is that the quantity of iron which goes into the converter, the open-hearth furnace, the puddling mill and the foundry must be enormous in the aggregate.

The status of the anthracite furnaces was as follows:

Anthracite Furnaces January 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.	23	11	4,014	12	3,154
New Jersey.	14	5	2,313	9	3,285
Spiegel.	3	3	229	0	0
Pennsylvania:					
Lehigh Valley.	46	33	12,616	13	3,662
Spiegel.	1	1	57	0	0
Schuylkill Valley.	37	17	7,251	20	5,270
U. Susquehanna Valley.	17	11	4,118	6	1,402
Lebanon Valley.	16	14	7,024	2	522
L. Susquehanna Valley.	18	10	5,235	8	2,030
Totals.	175	105	42,857	70	19,330

For the past 13 months our records show the following:

	Furnaces in blast.	Capacity per week.
January 1, 1890.	105	42,857
December 1.	100	40,053
November 1.	96	40,003
October 1.	94	36,558
September 1.	93	35,997
August 1.	88	34,377
July 1.	89	34,142
June 1.	91	34,386
May 1.	95	35,315
April 1.	102	37,977
March 1.	103	37,937
February 1.	107	39,187
January 1, 1889.	107	38 726

In New York, the second Crown Point is now running, and Poughkeepsie has both its furnaces producing. A second Andover blew in in New Jersey during December and Franklin resumed; the brief interval of idleness being utilized to build improved Cooper hot-blast ovens. Pequest probably will blow during the current month. In the Schuylkill Valley, Anvil has blown in. In the Lehigh Valley, Coleraine started in December, and the second Lock Ridge became a producer. Montour in the Upper Susquehanna stopped last month, but on the other hand, Union resumed. No. 2 Paxton is being prepared for work, and the Chestnut Hill furnaces are to resume, so that the make of the Lower Susquehanna will become larger at an early date.

The status of the coke furnaces was as follows:

Coke Furnaces January 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.	4	3	2,869	1	1,172
Pennsylvania:					
Pittsburgh district.	20	19	23,637	1	1,575
Spiegel.	1	1	672	0	0
Shenango Valley.	19	15	10,983	4	2,259
Juniata and Conemaugh valleys.	17	11	5,545	6	2,510
Spiegel.	1	0	0	1	500
Youghl. Valley.	5	4	2,133	1	195
Miscellaneous.	4	4	2,602	0	0
Maryland.	2	2	1,960	0	0
West Virginia.	6	3	1,755	3	1,256
Ohio:					
Mahoning Valley.	15	13	11,084	2	1,529
Central and Northern.	18	15	11,353	3	1,700
Hocking Valley.	15	6	1,794	9	1,870
Hanging Rock.	14	6	1,259	8	1,480
Indiana.	2	2	370	0	0
Illinois.	13	10	11,253	3	3,036
Wisconsin.	4	4	2,465	0	0
Missouri.	5	2	913	3	1,273
Colorado.	2	1	534	1	475
The South:					
Virginia.	13	11	5,798	2	1,100
Kentucky.	4	3	854	1	310
Alabama.	28	24	14,618	4	1,765
Tennessee.	11	10	4,945	1	500
Georgia.	2	0	0	2	800
Totals.	225	169	119,396	66	25,395

As compared with the 13 previous months, the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
January 1, 1890.	169	119,396
December 1.	162	116,319
November 1.	160	112,269
October 1.	154	102,454
September 1.	141	96,744
August 1.	137	96,720
July 1.	136	96,584
June 1.	135	91,771
May 1.	147	98,399
April 1.	151	100,060
March 1.	150	100,757
February 1.	150	98,518
January 1, 1889.	157	103,726
December 1, 1888.	151	101,748
November 1.	146	94,695

In New York Troy has now two of its large furnaces at work. One of the Edgar Thomson furnaces in the Pittsburgh district is out for relining and repairs. On the 7th inst. Clinton Furnace, of the Clinton Iron and Steel Company, was stopped. It will be enlarged and extensive improvements are to be made, so that its product will reach 100 tons per day. It will be ready for operation on the 1st of March. Work is being pushed rapidly on the two stacks of Carnegie Brothers & Co., Limited, at Braddock, and one of them will probably be ready to go into blast within 60 days. The new plant of the Monongahela Furnace Company, at McKeesport, Pa., is well under way, but will probably not become a producer of iron before July or later. Full work continues in the Shenango Valley. Alice was to have blown in on the 6th inst. On the Juniata the Everett has blown in. Otherwise there are no changes to report. In West Virginia and Maryland there has been no news of interest.

In the Mahoning Valley capacity continues to be engaged fully. In the Hocking Valley Crafts has resumed after a long idleness. In the Hanging Rock region Belfont is to begin at an early date, if, indeed, the furnace has not already resumed at this writing.

In Indiana Vigo started on the 28th. In Illinois, Wisconsin and Missouri there have been no changes. In the latter State Missouri Furnace has stopped for repairs. It will resume in February, in which month Jupiter, too, is expected to begin making iron again. In the South one of the Alice furnaces of the Tennessee Coal, Iron and Railroad Company has gone into blast.

The condition of the charcoal furnaces was as follows:

Charcoal Furnaces January 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.	14	7	610	7	480
New York.	8	3	361	5	523
Pennsylvania.	16	6	385	10	649
Maryland.	6	2	246	4	380
Virginia.	18	3	145	15	716
West Virginia.	3	0	0	3	165
Ohio.	11	7	424	4	198
Kentucky.	2	2	190	0	0
North Carolina.	2	1	70	1	70
Tennessee.	7	3	801	4	443
Georgia.	1	1	181	0	0
Alabama.	13	8	2,158	5	885
Michigan.	23	11	3,766	12	3,658
Missouri.	2	2	582	0	0
Wisconsin.	6	3	1,560	3	710
Texas.	1	0	0	1	173
California.	1	0	0	1	120
Washington.	1	0	0	1	192
Oregon.	1	0	0	1	190
Totals.	136	59	11,485	77	9,552

As compared with previous months the year began as follows:

	Furnaces in blast.	Capacity per week.
January 1, 1890.	59	11,485
December 1.	66	12,779
November 1.	67	12,893
October 1.	63	12,047
September 1.	60	11,327
August 1.	61	11,902
July 1.	60	10,727
June 1.	60	10,962
May 1.	54	10,629
April 1.	53	10,173
March 1.	56	11,081
Feb. 1.	62	11,219
Jan. 1.	67	11,946
Dec. 1.	71	12,286
Nov. 1.	73	12,724

In New York and New England no changes have taken place in the status of the blast furnaces running. In Pennsylvania Isabella lost a charcoal stockhouse on the 26th of December containing about 60,000 bushels of charcoal, the loss being $10,000, fully insured. The furnace was forced to blow out on the 30th in consequence of this disaster. In Virginia the number of active plants has been reduced to three, Cedar Run having blown out during December. In the Hanging Rock region, Ohio, Mt. Vernon stopped on the 24th ult. in order to put in a new hearth. Centre is preparing to blow in, and will probably be in active operation in April. In Michigan current make has been reduced further by the blowing out of Spring Lake on the 30th ult. to put in a new hearth and a new lining. It is expected that the furnace will resume operations on or about the 1st of February. In the South the La Grange furnace was banked during the greater part of December. Round Mountain, in Alabama, has blown out, the other furnaces running as before. In the far West, Irondale blew out on the 4th ult., to remain idle until the spring, until repairs to the hot oven are made.

STOCKS.

In order to render the monthly blast furnace report of *The Iron Age* of even greater value to the trade, we have begun the collection monthly, of reports of stocks on hand. Complete statistics are now collected only at intervals of six months, forming a part of the admirable summary of James M. Swank, manager of the American Iron and Steel Association. It is not our purpose now, nor will it be our custom in the future, to distribute these unsold stocks by States and districts. We believe that the method which we propose

to follow will both command the co-operation of producers and prove of service to the trade. That method is simply to state the total of the stocks reported to us, coupling it with a report of the aggregate capacity which the furnaces carrying the iron represent weekly. Thus, we have for the first of January reports from anthracite furnaces whose weekly capacity is 17,629 gross tons, taking their product for the last six months as a basis. Of these furnaces only three are not actually making iron or have not recently been producers. A good many of these have no stocks at all. Now, the total unsold stocks reported by these concerns aggregate 61,811 gross tons. This figure does not include the stocks at rolling mills or steel works which consume their own iron. Three of the latter alone represent a capacity of about 10,000 tons of product weekly of anthracite iron. We believe that this method of reporting unsold stocks in the hands of producers available in the open market has its great advantages. It emphasizes very clearly the relation between the current capacity of furnaces running on iron for sale and the stock which they are carrying.

Similarly, 78 coke furnaces, with three exceptions now running, with a capacity of 46,513 gross tons weekly, report stocks aggregating 56,835 tons. Among them are 21 Alabama, Tennessee and Georgia furnaces, with a capacity of 12,322 tons weekly, whose unsold stock on January 1 was 17,989 gross tons. This statement of stocks does not include the large steel works and many rolling mills whose furnace product does not reach the open market. Thus the former alone with the plants under their management represent 32 furnaces with 24,825 tons weekly capacity whose stocks are not counted at all.

The position with charcoal furnaces is quite different, since very few of them produce iron which does not go into the open market. Thirty-nine charcoal furnaces, nearly all of them running now, with an aggregate capacity of 8494 tons weekly, report unsold stocks on hand of 69,331 tons.

Figures like those submitted do not, of course, possess the importance which they will acquire as comparisons become available for many successive months. Quite a number of producers have reported to us the quantities of iron on hand with the significant statement that it is sold. In such cases it was not included in our totals. Others have gone a step further, reporting the quantity sold for future delivery. If it were possible to collect such data regularly, reliably and extensively they would throw a good deal of light on the situation.

Charles Himrod & Co., iron merchants, Rookery Building, Chicago, have issued their annual chart showing the course of Chicago pig-iron prices, brought down to the close of 1889. The upward slant which prices have taken since last June is very decided. The period covered by the chart begins with 1882. The following remarks are printed at the bottom of the chart: "The most striking characteristics of the pig market during the past year are as follows: First, the production has increased enormously, being greater than at any other period in the history of the trade, the manufacture in this country during the closing months of the year being equal to the amount made in Great Britain. Second, prices during the year have reached the lowest point ever made, and the average for the year is probably lower than the average for any previous year; for the first time prices in England and America being nearly the same. Third, the consumption fully kept pace with the production, so that at the close of the year we find a strong market with an upward tendency in prices; the quotations, however, for the closing weeks being mostly nominal, as buyers have not taken large quantities at the figures sellers were naming.

CORRESPONDENCE.

The Press vs. the Hammer.

To the Editor.—Since this is the age of steel, every new idea advanced worthy of consideration is greeted with pleasure. The more we become familiar with its mysteries the more are we convinced we know but little of the true worth of steel. The most economic and effectual mode of manipulating steel is a subject of much interest to the steel-manufacturing world. The process of hammering is yielding to the more rapid action of the press, but, like all valuable improvements, the latter will not only have to establish its superiority by demonstrated facts, but overcome existing and deep-rooted prejudice. To discuss intelligently the relative merits of these two agencies of manipulating steel to determinate shape it is well to have some knowledge of the normal condition of the ingot when received for manipulation.

Not only Bessemer and open-hearth steel ingots are honey-combed to a large extent, but this is true also of the best crucible-cast steel the world has yet produced. And did space permit, an examination of how these honey-combs are caused would be very interesting reading to the student in metallurgy. These globules as a rule become more numerous at the upper end of the ingots, and in crucible steel for the best grade of tools, they are what is familiarly known as tapped, or have the ends broken off while in the ingot, and prior to any other manipulation. This is done for economical reasons, in order to avoid expending labor upon material known to be unfit for the market. The blow-holes existing on the surface of the ingot are welded by a flux of borax and red-clay, as a matter of economy. It will, however, be recognized at once by thoughtful and experienced men that globules existing towards the center of large ingots cannot be welded by a mere surface heat, and are consequently only forced from orbicular to longitudinal forms by the action of the hammer, providing the ingot is worked on all sides of the square. If hammered only on one side they assume irregular forms, and should they be large and near the surface, frequently produce blisters and consequently defective bars.

If, however, they are not hammered at all, but rolled longitudinally these orbicules form seams in the bar or plate directly in the line the ingot is rolled and are in length proportionate to the size of the globule, and are always and under all circumstances injurious. It is impossible under the hammer, with such limited space as the surface of the hammer dies, to cover as much area as is desirable at one and the same time, so that one part becomes too cool for required results, while the process of manipulating the other is going on.

It is well known to all practical steel workers that where a number of ingots are heated together in a furnace and are finished for the market by one heat the molecular structure of every bar will vary in appearance in proportion to the heat at which such bar is finished. Yet this has no detrimental influence on tools afterward manufactured from it, providing that no part of such ingot has been heated to a greater degree than permissible. We have often read and much oftener heard that hammering steel is a refining process, and this idea is advocated by some very able scientists and metallurgists. We, however, recognize no practical truth in such a statement, and are inclined to think it is used as a customary form of expression rather than because it is a demonstrated truth. That hammering under certain conditions condenses the molecules or crystalline formation and presents to the eye a finer grain is true. It does not eliminate any deleterious elements the steel already contains; neither does it increase any valuable property of its composition, and therefore cannot be a refining process, nothing being added thereto or taken therefrom.

Hammering under other conditions will produce appearances quite different from those described above. For instance, take a heavy bar and nick across its face with a chisel, "and yet it cannot be broken by repeated blows of the sledge." Tap this lightly across the place nicked, "having no bearing underneath," by a small hammer and in a short time it will readily yield to the force it previously resisted, and the grain shown by the fracture will be coarse in proportion to the length of time it was subjected to the oscillating influence of the small hammer. All crucible cast steel ingots for the better class of tools are welded under the hammer in order to consolidate the honey-combs referred to, both as a matter of economy and quality. But it is a very unsatisfactory process, both as a mechanical and mercantile result. Hence, the progress of the age and the competition against old practices demands some appliance superior in as many points as possible to the old ones. It is impossible to apply the hammer to an ingot while it is yet in a semi-molten condition, and yet it is at this exact moment when some extraneous force should be applied in order to produce the most satisfactory results. So far as science has discovered or mechanical skill invented the press seems to be the acme of all methods of manipulating steel, because it and it only can be brought to bear on the ingot while in the condition described. With proper molds and hydraulic pressure all grades of molten steel can be rendered practically free from these mischievous and costly orbicules. It appears somewhat astonishing when calmly considered that progress in this direction has been so dilatory, because of all other evils in connection with the financial success of manufacturing good steel we know of none so inimical as the presence of these globules, and no other means of consolidation into one homogeneous mass but by the action of the press. Yours very truly,

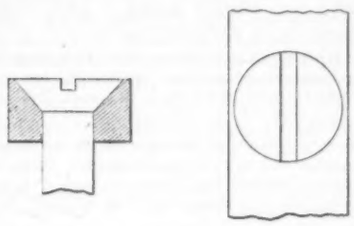
BEN CATLEY.

PITTSBURGH, PA., January 7, 1890.

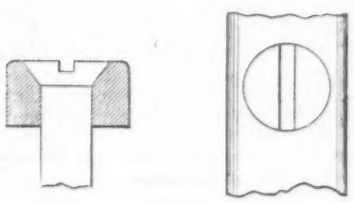
Flat-Head Machine Screws.

Editor The Iron Age: I wish to call the attention of manufacturers through your valuable paper to what I consider a great evil in flat-head machine screws—that is, the inordinately large size of head. The makers of such screws seem to have followed the proportions of, and in some cases exceeded, the wood screw in size of head, which is to be used in soft wood. Now, I see no reason for such a large head in a machine screw, but many against it. In the first place it must be more difficult, cost more, and make it weaker to upset so much more metal for the head. Then if the head is not concentric with the thread, which it rarely is, the divergence is greater for being so large. Again, if the countersink is not exactly the same angle as the head it bears only on a small point, and if subject to much strain will get loose as the head becomes settled into its seat. But the worst feature about it I think, is that it frequently cuts so much strength from the piece to be secured thereby. For example, if you wish to use a $\frac{1}{4}$ inch screw to fasten a piece $\frac{1}{4}$ inch thick by $\frac{1}{2}$ to $\frac{3}{4}$ inch wide, if you sink the head in flush you have nothing left of your piece to

speak of; and in many cases I prefer to turn off some of the head, in order to make a neat, strong and good job. In regard to round heads the evil is not so great, as they do not have to be let in, but as their heads come off with so little provocation I think it might possibly be an advantage if they too were made a trifle smaller. I send you a sketch illustrating my idea. I also send you an ordinary machine screw of $\frac{3}{16}$ diameter, and one of the same size that I had made especially to order to sample sent, and I find them very much more satisfactory. The third sample is the shank of a wood screw of the same size.



Ordinary Head.



Special Head.

ALFRED HARLEY.

ALBANY, N. Y.

The Coke Workers' Demands.

On Monday, the 8th inst., the coal miners' agreement was submitted to the coal operators of the Connellsville regions. The principal stipulations are as follows:

Mining.—Headings, wet, $1.30 per 100 bushels; dry, $1.20. Cuts and chutes, wet, $1.30; dry, $1.20. Rooms, until widened out, $1.30; dry, $1.20; after widened out, wet, $1.15; dry, $1.05. Ribs and pillars, wet, $1.15; dry, $1.05. Drivers, cagers and rope riders, $2.15 per day (eight hours); trackmen, timbermen and horsebackmen, $2.15 per day; watermen and ditchers, $2.15 per day; dumpers and tipplemen, $2.05 per day; checkmen, $2,30 per day; boss drivers, $2.50 per day; boss drivers, where they keep the time, $2.65 per day; trappers and oilers, $1 per day; furnacemen and fanmen, $2 per day; pumpers, $2 per day; gas inspectors, $2.50 per day; charging ovens, $2.15 per day; leveling ovens, 11 cents per oven; drawing ovens, 62 cents per 100 bushels charged; loading stock coke, 30 cents per oven; hand-picked coke, 25 cents per oven additional; select coke, 10 cents per oven additional; forking box and stock cars, all under 40,000 pounds, $1.15 per car; 40,000 pounds, $1.35 per car; all over 40,000 pounds according to capacity branded on car, $1.65 per car; car shifters, drillers and brakemen, $2 per day; helpers, $1.75 per day; yard locomotive engineers, $3.25 per day; charging engineers, $2.50 per day; stationary engineers, $2.50 per day; firemen with gas or coal, $2 per day; blacksmiths, $2.60 per day; blacksmiths' helpers, $1.90 per day; carpenters and car builders, $2.40 per day; car greasers, $1.90 per day; masons and bricklayers, $3 per day; carters and yard laborers, $1.75 per day; firing cold ovens, 25 cents per oven; closing ovens on lay-off days and Sundays, 1 cent per oven; teamsters, $1.75 per day; steam ram man, $2.10 per day; drivers at crushers, $1.75 per day; cagers at crushers, $2 per day; car loaders at crushers, $1 per day; car cleaners, 10 cents per car.

The agreement was received by the operators and an adjournment was had until the 16th inst. when they will reply to it. They will doubtless present a scale of their own differing materially from the above.

Obituary.

WILLIAM D. KELLEY.

Representative William D. Kelley, of Philadelphia, the "Father of the House," by reason of his having been the member in longest continuous service; one of the leading champions of protection to American industries and especially of pig-iron, from which fact he was frequently referred to as "Pig-Iron Kelley," died at the Riggs House in Washington on the 9th inst. The Judge was 76 years old and had been more or less of an invalid for 12 or 15 years, being a victim of stomach catarrh.

William D. Kelley was born in Philadelphia, April 12, 1814, and began life as a poor, fatherless boy. At the age of 11 years he was an errand boy in a bookstore and subsequently a copy-reader in Jasper Harding's *Inquirer* printing office in Philadelphia. He subsequently learned the trade of a jeweler, serving a regular indentured apprenticeship. While working at his trade he improved his leisure hours in study, frequently contributing to the press, and taking an active part in politics. Later he studied law and in March, 1846, Mr. Kelley was appointed a judge of the Court of the Common Pleas, and in 1860 he was elected to the Thirty-seventh Congress. He was successively re-elected and has served in the House continuously for nearly 30 years. From 1881 to 1883 he served as chairman of the Ways and Means Committee and in December last, at his own request, was placed on the Committee on Manufactures.

Judge Kelley made several voyages to Europe and through this country and always utilized his journeys to inform himself with regard to matters connected with his Congressional duties, and especially with regard to the tariff question. He made a prolonged visit to the California coast when he investigated the subject of labor in the West. On one of his visits to Europe he made an extended investigation of labor affairs in the "black district" of England, holding interviews with working men and working women with regard to wages and living, the results of which he gave to Congress. On one of his visits he had a long and interesting interview with Prince Bismarck on the subject of the tariff policies of both Germany and the United States at a time when tariff legislation was a principal topic of discussion in German legislation.

WILLIAM H. M'CURDY.

William H. McCurdy, a well-known iron manufacturer, died suddenly at his home in Cleveland on the 8th inst. Mr. McCurdy was a stockholder in the mills of Cartwright, McCurdy & Co. in Youngstown, Ohio, and brother of Robert McCurdy, president of the First National Bank and of Dr. John McCurdy. During late years he had been extensively engaged in the Lake Superior ore trade.

J. B. SWINDELL.

J. B. Swindell, general manager of the Swindell & Smythe Company, of Pittsburgh, died at his residence, in Allegheny City, Pa., on Wednesday, the 8th inst., of pneumonia. Mr. Swindell was at work in Tyrone, Pa., for some days and on the Monday preceding his death fell from a scaffold and fractured his thigh. It was reported that this was the cause of Mr. Swindell's death, but we are informed that his death was due to the above disease.

Providence Notes.

PROVIDENCE, January 13, 1890.

Superintendent John Whipple, Jr., of the Edison Electric Light Company, of Newport, has a large amount of business on his hand at present. As the company now have all the electric lighting in the city they find their present plant much too small, so they are erecting to the south of their present station a one-story addition 63 x 43 feet in which to place a 200 horse-power engine and two 125 horse-power dynamos, two 70 horse-power engines and a new 150 horse-power boiler which will make the total equipment of the station, 12 dynamos, 6 engines and 5 boilers. The old iron stack is to be taken down, and in its stead will be built a 100 feet brick chimney, 11 feet at the base and 8 feet at the top. This portion of the work is in the hands of the Jarvis Engineering Company, of Boston. The preparation for this large increase of power is being provided for the building of new lines and the thorough repairing of the old lines of the Newport Illuminating Company (street light circuit) which is in poor shape and much will need rebuilding.

C. B. Cottrell & Son, of Westerly, have just completed a large foundry for their printing-press manufactory. Their works cover about nine acres along the Pawcatuck River, the river frontage being over 2000 feet. A side track from the New York, Providence and Boston Railroad is being completed to place cars in their shops for the delivery and receiving of freights.

The Nicholson File Company finding that their increase of business demands larger quarters, especially in respect to the forging department, have decided to erect a new building on their grounds, at 118 Acorn street. It will be built substantially of brick with a stone foundation, and though most of the space will be fitted up for a forging-shop, there will still be several rooms left for the accommodation of other branches of the manufactory. The work of hauling the stone has already been commenced, and the building will be started as soon as more clement weather permits.

The works of the Nichols & Langworthy Machine Company, at Hope Valley, are being improved and rearranged. The past week has been an exceedingly busy one in filling orders for the Edison electric light station, Pearl street, New York. Three heavy high-speed engines have been already shipped to take the places of those destroyed in the recent fire. The largest cylinder was an 18½ x 18, with a nominal horse-power of 200, but with a capacity of 250 horse-power. The other two are 15½ x 16 and 14 x 15, with a 150 or 175 horse-power capacity. In order to fill the orders it has been necessary to run a part of the works nights during the week.

The Warren Foundry Company was obliged to shut down on the 6th inst. by reason of the illness with "la grippe" of so many of its employees.

Edward G. Walden, for the past 12 years superintendent at F. E. Perkins' Iron Works, died at his residence, 7 Tobey street, on the morning of the 9th inst., after a short, but painful illness. The deceased was born in Newport in 1827, but has resided nearly all his life in this city. He was a graduate from Belden's Institute. He leaves a wife and one daughter.

CLIFFORD.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 14, 1890.

The interest of Secretary Tracy has become thoroughly enlisted in the question of armor plate. Since the recent experiments in the Redeman-Tilford steel have shown such remarkable results he has issued a circular for armor plates of American manufacture to enter into a competitive test under naval regulations at the Annapolis Proving Grounds, which will close May 8, 1890. At this competitive test it is expected that the Redeman-Tilford Steel Company will present two or more plates as per regulations. They expect to show the world that American armor plate cannot be penetrated with any known projectile.

It is to be said of Secretary Tracy's administration of the navy that greater and more rapid advance is being made in modern improvements than at any former time. From indications in a few years, with the present intelligently directed energy, the United States will be in advance in everything appertaining to a modern navy. The struggle between armor and projectiles has been going on for years, till the leading nations of the world have been spending both time and money in trying to gain the advantage, either in armor plates or projectiles. When it is remembered that three years ago the manufacture of steel armor-piercing projectiles was said to be in its infancy, some of the results since attained in England seem almost marvelous. A 12-inch projectile has perforated a target faced with a 16-inch compound plate of admitted best quality of steel; the shot, in the words of the report, was so little deformed that it could be used again. It will thus be seen that when projectiles of this class will perforate 16 inches or more of the best known armor plate the question of building ironclad war vessels becomes a very complicated one. The 20 inches of armor plate has been demonstrated to be so heavy that it required great power to propel vessels at even the limited speed of 8 or 10 knots per hour. The vessel's carrying capacity is so small that if she can even float at all she cannot carry armament, crew, provisions and coal sufficient to sail over 500 miles. In view of these facts the attention of the naval world and inventive genius has been turned to the subject of producing or inventing an armor plate of less weight that will deflect or throw off these powerful projectiles propelled by the best improved cannon. The best tests that have been made plainly show that America today through the enterprise of its present Secretary of the Navy stands foremost in advancement in this direction. In 1888 England had a competitive trial of armor plates under the Admiralty at Portsmouth, nine of the leading steel manufacturers competing. The plates to be tested were of uniform dimensions—viz., 96 inches long, 72 inches wide, 10½ inches thick, weighing each about 17,920 pounds. Each plate was bolted to a solid oak backing. The firing was from a 6-inch breech-loading rifle gun. The weight of the projectile was 100 pounds; powder charge, 48 pounds; striking velocity, 1975 feet per second. This projectile, with its velocity, gives a total striking energy of 2708 foot-tons, the energy per inch of circumference being 146.6 foot tons. Five shots were fired at each plate; the first two being Holtzer forged steel, the third and fourth being Palliser chilled cast iron and the fifth another Holtzer. The trials not being public, only the Admiralty officials and the manufacturers of the plates were permitted to be present.

The first plate tried was a Cammell compound plate (Wilson patent). The first two shots penetrated it to an estimated depth of 5 inches and broke up, the pieces being jarred out by shock of subsequent impacts. The Palliser shot indented the surface of the plate to a depth of 2 inches and broke up. The fifth shot penetrated about 5 inches and fell back much deformed.

In the trial of a Brown compound plate (Ellis patent), each of the three Holtzer projectiles perforated the plate and the surface of the plate was cracked. The two Palliser shots did no material damage.

In the trial of the Cammell solid steel plate the Holtzer projectiles penetrated to some depth (not given in inches), but stated to be much greater than in case of the compound plate, which was 5 inches, and therefore estimated at 8 inches.

In the test of the Brown solid steel plate the first shot perforated plate and buried itself about 2 feet in the backing. This test shows the best results that have been obtained in Europe and which were considered the best that could be accomplished.

Under the late Administration a circular was issued in 1886, asking American manufacturers of steel to enter a competitive test for making armor plates, allowing until October 1, 1888, to present them, the tests to take place at the Annapolis proving grounds, but no plate was ever presented.

This was the position in which Benj. F. Tracy, Secretary of the Navy, found the armor-plate question upon assuming charge of that office March 4, 1889.

In September, 1889, he received an application from the Redeman-Tilford Steel Company to make a series of tests at the Washington Ordnance Yard, under the direction of an official board. The application was granted. Capt. Wm. Folger was directed to formulate the tests. Two 30 x 30 x 6 inch solid rolled steel plates of equal carbon were to be submitted to the official board, consisting of Lieutenants Badger, Nicholson and Ackerman. Both plates were to be sampled by taking out pieces. The tensile strength, elastic limit, &c., were to be tested. Drillings were to be made at several places in each plate, the shavings to be analyzed to get the amount of carbon, after which one of these plates was to be treated by the Redeman-Tilford Steel Company in their patent chemical bath, to make one-half (3 inches) hard, drill-proof and slot-proof and leave the back 3 inches soft malleable steel, a thing never before done. It has been the theory of the naval world that if this could be done the plate so treated would have greater resisting power than any ever invented.

This 30 x 30 x 6 inch plate was successfully treated as requested, and upon coming out of the bath the front surface for 3 inches could not either be slotted or drilled; in fact, it could not be filed, while the back for the depth of 3 inches was soft and malleable. The successfully-treated plate and the duplicate untreated were taken to Annapolis Proving Grounds and subjected to firing tests, with the following results taken from the official report of the Naval Board:

Three-pound and 6-pound Hotchkiss projectiles were used in comparative tests at best-known ranges. The penetration of 3-pound piercing shot was over one-half greater in the untreated plate than the treated plate. The first 6-pound projectile fired at the untreated plate penetrated over 4 inches and broke the plate into several pieces. Five 6-pound projectiles were then fired at the treated plate and showed a penetration of from ¾ to 1¼ inches, and it was clearly demonstrated that the treated plate would stand the firing of the 6-pound shot all day.

The following tests, compared with the English tests cited above, show the great advance already made over any other nation on the globe in the production of armor plates purely American in all their forms. The data is taken from the forthcoming official report:

Size of plate, 30 x 30 x 6 inches; weight, 1500 pounds; plate insecurely fastened and not properly backed. Size of shot, 6 inches; weight, 100 pounds; maker, St. Chamond; cost, over $100; service charge powder, 49 pounds, firing from breech-loading 6-inch rifle gun. Striking velocity, 2103 feet per second, the projectile and velocity giving a total striking energy of 2830 foot-tons. Energy per inch of circumference, 152 foot-tons. Shot struck plate in upper right-hand corner about 7 inches from top, pentrated less than 3 inches and broke up. It will be seen that this small plate, 30 x 30 x 6 inches, was subject to a much more severe test than the Cammell or Brown's plate in their test in England, while their weight was over 12 times as much, twice as thick, and they were properly backed and fastened; they were perforated with the same weight of shot and at less velocity.

The chief point in view in these experiments is to encourage the discovery of a quality of steel with resisting qualities which will justify the lightening of the weight ot the armor, and as a consequence give greater space and larger carrying capacity.

The Committee on Ways and Means continue their hearings and at the same time are formulating their bill, which they expect to have ready early next month.

The following is the record of a test made upon an axle manufactured by the Straight Fiber Iron Company, of Chicago:

No. blow.	Drop.	Deflec.	No. blow.	Drop.	Deflec.
	Feet.	Inches.		Feet.	Inches.
1	10	3⅝	17	19	3⅞
2	10	1	18	19	3½
3	10	3¼	19	19	3⅝
4	15	2⅞	20	19	3⅝
5	15	3	21	19	3½
6	15	2¾	22	19	3¾
7	15	3⅝	23	19	3¾
8	18	4¼	24	19	4
9	18	3⅝	25	19	3⅝
10	18	4	26	19	3⅞
11	18	3⅝	27	19	3⅝
12	18	4	28	19	4
13	19	3⅝	29	19	3⅝
14	19	3⅝	30	19	3⅞
15	19	3⅞	31	19	3¾
16	19	3⅝	32	Broken.	

The axle was a 4¼ center master car builders' axle. When submitted to some experts the test was pronounced unequaled.

The Illinois Steel Company have authorized the publication of the following statement showing the quantity of steel rails sold in 1889 for delivery in that year up to December 21, with the average price that they netted at the works of the company:

Month.	Quantity tons.	Value.	Average price.
January....	98,901	$2,942,078	$29.74
February...	56,931	1,667,516	29.27
March.....	21,116	606,238	28.71
April.....	45,350	1,284,863	28.33
May.....	11,261	320,271	28.40
June.....	73,076½	2,040,363	27.90
July.....	41,176	1,175,510	28.52
August.....	16,770	497,405	29.66
September..	20,462	647,148	31.62
October	8,647½	288,888	33.40
November..	33,542½	1,085,336	32.35
December ..	727	22,127	35.29
Year 1889.	427,860½	$12,577,748	$29.39

The largest sheet of plate-glass ever cast in the United States is claimed by the Diamond Plate Glass Works of Kokomo. Its dimensions were 122 x 202 inches, or 170 square feet, and its weight in the rough was 1530 pounds. When finished it weighed 582½ pounds. The next largest plate ever cast was at Crystal City three years ago. That plate was 130 x 186 inches, and while 8 inches wider than the one cast at Kokomo, it was 16 inches shorter.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, January 13, 1890.

Pig Iron.—So far as can be ascertained no round lots were sold during the past week, but a fair trade was done in a small way. Prices are firmly held. The Southern makers present a united front, having apparently determined to abstain from selling until they can get the equivalent of $16 at Birmingham. A small stock is available from second hands at slightly lower prices, but the floating demand will probably absorb that in a brief period of time. Local and Ohio Irons maintain their former status. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, $23 @ $23.50; Local Coke Foundry, No. 1, $20 @ $21; No. 2, $19.50 @ $20; No. 3, $18.50 @ $19; American Scotch (Ohio Strong Softeners) No. 1, $21.25 @ $21.50; Ohio Silveries, No. 1, $19.75 @ $20; Southern Coke, No. 1, $20 @ $20.50; No. 2, $19.50 @ $20; No. 3, $19 @ $19.50; Tennessee Charcoal, No. 1, $22 @ $22.50; Alabama Car-Wheel, $26 @ $27.

Bar Iron.—Among the sales reported during the week was one of 1000 tons of Car Iron at about 1.87½¢, flat, Chicago; another of 500 tons, jobbers' specifications, at 1.90¢, half extras. Other orders for Car Iron are in the market, following contracts recently given out for 1200 cars, as well as inquiries for good specifications from other quarters. The general quotation for mill lots is 1.95¢, half extras, for Common Iron, f.o.b. Chicago, buyers being specially favored if they can get below it. Small lots are firmly held at 2.10¢ @ 2.20¢ from store, according to quantity.

Structural Iron.—The open winter has enabled building operations to be prosecuted so continuously that the mills have been kept busy filling contracts which would otherwise have been carried over to the spring months. The Keystone Bridge Company are the lowest bidders on the construction of three miles of the "alley" elevated railroad, for which proposals were opened on the 11th. Considerable additional new work is being figured on. Prices are unchanged.

Plates, Tubes, &c.—Business has been satisfactory since our last report, and some good sized orders have enlivened the trade. One order called for 68,000 lb of Rivets. The boilermakers and the railroad repair shops are buying freely. Mill prices are very stiff and a decided advance is looked for this week: Dealers quote: Nos. 10 to 14 Sheet Iron, 2.85¢ @ 2.95¢; Steel do., 3.15¢ @ 3.25¢; Tank Iron, 2.75¢ @ 2.80¢: Tank Steel, 3¢ @ 3.10¢; Shell Iron and Steel, 3.25¢; Flange Steel, 3.50¢ Fire-Box, 4.25¢ @ 5.50¢; Boiler Rivets, 4¢ @ 4.25¢; Norway Rivets, 40 %; Boiler Flues, 1¼ inches and less, 50 %; 2 inches and over, 55 %.

Sheet Iron.—The demand for Galvanized Sheets is again on the increase, and although the trade of December was nearly up to high-water mark, the prospects are that this month will come well up to it. Juniata grade is still quoted at 62½ % for mill lots, and from 50 and 10 % to 60 % for small lots, according to quality. Some inquiry has developed for Black Sheets, but the mills are disinclined to quote to any extent on forward deliveries, as prices may be higher as spring approaches. Quotations for No. 27 Common for January shipment continue at 3.30¢, f.o.b. Chicago, from mill, and at 3.40¢ @ 3.50¢ from store, according to quantity.

Merchant Steel.—Business is in fair shape and prices are firmly held. Carload lots of Machinery, Toe-Calk and Spring Steel are selling at about 2.85¢, Chicago, and in small lots from stock at 3¢ @ 3.25¢; Tire Steel and Soft Steel Bars from stock, 2.50¢ rates; Tool Steel, 7½¢ and upward; Crucible Sheets, 7¢ @ 10¢.

Steel Rails and Track Supplies.—Some business in Steel Rails is being offered, but sellers report no inquiries of magnitude. The usual quotation is $37.50. Steel Angle-Bars are held at 2.25¢; Iron do.. 2¢ @ 2.10¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.90¢ @ 3¢; Hexagon do., 3.05¢ @ 3.15¢.

Old Rails and Wheels.—Old Iron Rails were quite active during the week, values being maintained at $26.50 to consumers. Old Steel Rails sold at $21.25 for long lengths. Old Car-Wheels are much more active and now sell readily at $20.50.

Scrap.—The supply of Old Iron continues to accumulate, and some of the dealers are refusing to purchase Country Scrap, discriminating in favor of stock requiring less assorting. So much is offering from numerous sources that lower prices for Iron Scrap are looked for at an early day. Dealers quote selling prices as follows, per ton of 2000 lb: No. 1 Forge, $20.50 @ $21; No. 1 Mill, $16 @ $16.50; Nos. 2 and 3 Mill, $11 @ $11.50; Horseshoes, $19; Old Axles, $25.50; Fish-Plates, $23.50; Pipes and Flues, $15.50; Cast Borings, $10; Wrought Turnings, $14; Axle Turnings, $15; Stove Plate, $11; Machinery Cast $14; Mixed Steel, $16.50; Leaf and Coil Steel, $20; Tires, $21. Cast Borings are exceptionally scarce at present, and Steel Scrap is in good demand at firm prices.

General Hardware.—The Shelf Hardware jobbers are pleased with the briskness characterizing the trade of the new year, their traveling men now on the road sending in orders rapidly. Country buyers appear to be inclined to lay in good stocks, in the belief that prices are destined to go still higher. Heavy Hardware jobbers report a remarkable quantity of goods being sold for the season. So many dealers and consumers are replenishing stocks that the prospects are good for a continued demand.

Nails.—As previously announced, a meeting of Western Nail manufacturers was held at Wheeling on the 8th inst. and advanced prices, as it was predicted they would. The base rate for large lots of Cut Steel Nails from the factory is now $2.50, 60 days, or 2 % off for cash, f.o.b. mill. This price is named for 25¢ average above base, and no allowance or reduction is to be made in case the assortment or average runs above 25¢, but in case it is below 25¢ the base price is to be put up in the same proportion. This is a new regulation to which buyers will have to be educated, and it is expected that it may interfere with the sales for a time. Agents are now receiving urgent appeals to book orders at the old price, but buyers delayed too long. Jobbers here have advanced store prices of Steel Nails to $2.70, with 5¢ off for carload lots. Wire Nails are unchanged at $3.15 for small lots and $3.10 for carload lots.

Barb Wire.—Prices are firmly held at the new rate of 3.45¢ for small lots of Painted and 3.35¢ for carload lots, with the usual advance of 60¢ ₱ 100 lb for Galvanized.

Pig Lead.—Sales of 600 tons are reported at and around 3.70¢, which was the price asked at the close of the week, with 3.65¢ @ 3.67½¢ bid. The sentiment of the trade is divided as to the course of prices in the near future, some predicting an advance and others a continuance of present conditions and quotations.

Charles W. Davenport, 26 West Lake street, Chicago, has been appointed agent for the Ironton Rolling Mill Company, who have lately leased the New York and Ohio Iron and Steel Company's mill at Ironton, Ohio, and will manufacture Sheet Iron and Steel from Nos. 8 to 20 up to 40 inches wide by 144 inches long.

Joseph T. Ryerson & Son's stock sheet for January, which has just been issued, shows a particularly good stock on hand of Iron and Steel Plates, Sheets and Boilermakers' Supplies, especially when the heavy trade of the last few months is considered.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, January 14, 1890.

Pig Iron.—There has been an increased activity in Pig Iron the past week, Bessemer in particular, of which sales of some 10,000 tons were reported, and a firmer feeling obtains in consequence. While the market has been comparatively quiet for some weeks past, there has been no evidence of weakness developed; on the contrary, the feeling to-day is more confident than it was a week ago, confidence having been stiffened up by the increased demand. Some well-posted operators, who have given the situation careful investigation, regard the outlook both present and prospective with great confidence; they look for a still further improvement in the demand before the close of the present month, and would not be surprised to see prices go higher. Safe and reliable advices from the Lake Superior district report a very stiff Ore market, especially for Bessemer Ores, with some of the Ore companies sold for the year, and higher prices for Coke are looked for within a few weeks. This being the case, it is not strange that furnacemen are again talking higher prices for Pig Iron. With the cost of production increased, which seems probable, an advance in the product must follow. The furnaces both here and in the valleys are as a rule pretty well sold up. Some of them having contracts for Bessemer will not be in condition to make additional contracts for several months. Furnacemen east of the mountains can do better at Philadelphia and in New England than in this market, and there is no Iron being offered here from that section in consequence. We quote prices as follows:

Neutral Gray Forge	$18.00	@ $18.50,	cash.
All Ore Mill	19.00	@ 20.00,	"
Mottled Mill	17.50	@ 17.75,	"
No. 1 Foundry	20.50	@ 21.00,	"
No. 2 Foundry	19.50	@ 20.00,	"
No. 1 Charcoal Foundry	24.00	@ 25.00,	"
No. 2 Charcoal Foundry	22.00	@ 23.00,	"
Cold Blast Charcoal	25.00	@ 30.00,	"
Bessemer Iron	24.00	@ 24.50,	"

Sales of some 10,000 tons Bessemer reported in different lots for February, March, and April delivery at $24, $24.25 and $24.50, cash.

Muck Bar—Continues very dull, but an improved demand is looked for in the near future. We continue to quote in the absence of sales $31 @ $31.50, cash, although some sellers are refusing to accept less than $32, but they might as well ask $35, as buyers will not pay $32 as long as they can supply themselves at $31 @ $31.50.

Ferromanganese.—A sale of 50 tons reported at $101, cash, delivered in Pittsburgh—cost $98 at seaboard. Demand for some time past has been for small lots ranging from 25 to 50 tons, consumers generally being impressed with the belief that present prices are not likely to be maintained, although there is said to be a great scarcity of Manganese Ores.

Manufactured Iron.—There is continued a good degree of activity, mills generally being pretty fully employed, but complaint is still made that prices are low as compared with the cost of production. The outlook for an active spring trade, not only for Merchant Iron, but Structural Bridge Iron, as well as all leading specialties, never was better. We quote prices as before: Bars, 1.90¢ @ 1.95¢ (some firms quote at 2¢); Plates, 2.40¢ @ 2.50¢; No. 24 Sheet, 3¢ @ 3.10¢; Skelp Iron, 1.87½¢ @ 1.95¢ for Grooved and 2.20¢ @ 2.30¢ for Sheared, all 60 days, 2 % off for cash.

Nails.—Steel Cut Nails have been advanced during the past week 15¢ ℔ keg both here and at Wheeling, and it is expected that there will be a considerably increased demand within the next few weeks. Large jobbers may hold for a time, as they often do just after an advance has been made, to see whether or not it is going to be maintained. We now quote at $2.50, 60 days, 2 % off for cash. Wire Nails remain unchanged at $2.85 @ $2.90 in car lots, and $3 in less than a carload, 60 days, 2 % off for cash.

Structural Iron.—The demand is increasing and the outlook for a big trade never was better; the consumption of Iron in large buildings is steadily increasing every year, as there is a determination in the construction of all public buildings to use more iron and less wood in order to make them as near fire-proof as possible. Moreover, the low price of Iron in connection with its much greater strength is causing a much larger and increased consumption of the same. Prices remain unchanged. Angles, 2.45¢; Tees, 2.95¢; Beams and Channels, 3.10¢; Sheared Bridge Plates, Steel, 2.85¢; Universal Mill Plates, Iron, 2.55¢.

Steel Plates.—There is a continued good demand and prices are firm as quoted: Fire-Box, 4¢ @ 4½¢; Flange, 3½¢; Shell, 3¢ @ 3.10¢; Tank, 2.80¢ @ 2.85¢.

Old Rails.—There appears to be but little inquiry in this market just now for Old Iron Rails, but sales have been made during the week to mills in the Mahoning Valley at $29, delivered there, and consumers here would now have to pay that price if they wanted to buy. Old Steel Rails sold during the week at $24 @ $24.50, with but little difference being made as to whether they are short or long lengths. There appears to be more inquiry in this market just now for Steel than Iron Rails, but the supply of the latter in this country is steadily being reduced and will soon be exhausted, as there have been none made for a number of years.

Wrought-Iron Pipe.—The demand for Pipe continues to hold up remarkably well for the season of the year; the mills are all busy, some of them pretty well sold ahead, and prices are firm and unchanged. Discount on Black Butt-Welded Pipe 50 %; on Galvanized do., 42½ %; on Black Lap-Welded, 62½ %; on Galvanized, 50 %; Boiler-Tubes, 1¼-inch and smaller, 50 %; 2-inch and larger, 55 %; Casing, 5⅛-inch, 55 %. The Pipe Association meets in New York next week.

Merchant Steel.—There is a continued good demand for everything in this line and prices are steady as quoted: Tool Steel, 8¢ ℔ lb and upward; Crucible Spring Steel, 4¢; Crucible Machinery, 5¢; Open-Hearth Steel, 2¼¢ @ 3¢; Bessemer Machinery Steel, 2¼¢; Tire Steel, 2¼¢ rates.

Steel Rails—Are still quoted at $35 @ $36, free on cars at works, but the great proportion of the business reported here is at $35—lot of 5000 tons reported at the price last quoted. It is intimated that some mills are anxious for business and are taking all the contracts they can get at present prices, notwithstanding the prediction said to have been made by Mr. Andrew Carnegie that they will be worth $50 ℔ ton before the close of the present year.

Billets and Blooms.—There is a continued good demand. Bessemer Steel Billets are firm, with sales at $36.75 @ $37.25, as to size, quality and delivery. Nail Slabs $36.50 @ $37. Domestic Wire Rods, $52 @ $53.

Railway Track Supplies.—Demand continues light, as it usually is at this season of the year. No change in prices. Spikes, $2.15, 30 days, here, $2.25 at Chicago and St. Louis. Splice Bars, 2.10¢ @ 2.20¢; Track Bolts, 3.10¢ with Square and 3.20¢ with Hexagon Nuts.

Old Material—Is firm, with an increasing demand. Sales No. 1 Wrought (Railroad Shop) Scrap, at $23, net ton; Car Axles, $29 @ $30; Cast Scrap, $16.50, gross ton; Old Car-Wheels, $20.50 @ $21; Cut Axle Scrap Steel, $29 @ $30.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.
PHILADELPHIA, Pa., January 14, 1890.

The events of the past week have not been comforting to those who predicted a "booming" market. On the other hand, there is nothing upon which to base expectations of a reaction. There is a pause, which in course of a few days will doubtless help to develop the true inwardness of the position. If the consumption is going to be as large as was expected, buyers must make their appearance at an early date, or sellers will. For the present it is a stand-off on both sides. The demand is unquestionably very small, but so is the supply. Hence there is nothing definite upon which to base calculations on either side. If buyers come first, higher prices are almost a certainty. But if buyers have to be sought for a more or less serious reaction is inevitable. The chances are that a medium course will be developed—that is, a demand equal to the supply, and with no material change in prices. Meanwhile the course of events is watched with unusual interest, as it is a matter of more than ordinary importance to be on the right side. There has been too much "boom" in some of the Western markets, and while it may disappoint a few if prices fail to advance, the general result will be more satisfactory if things can be kept on an even keel. At any rate that is the feeling in this vicinity, and as far as can be seen that is likely to be the ultimate outcome of the present hesitancy.

Pig Iron.—The market is rather quiet, but there is no appreciable change in prices. All sales reported during the week have been fully up to the prices quoted for the past three or four weeks, and as yet there are no indications of oversupply. Producers are more inclined to meet the demand, nevertheless—that is, they are not as much afraid of being caught on an advancing market. There is no loss of confidence in current rates being maintained, there is less fear of any serious advance, and that really is about all there is to it. Sales during the week, so far as known, have been at figures varying from $20 to $20.50 for No. 1 Foundry, $19 @ $19.50 for No. 2 and $18 @ $18.50 for Gray Forge. A few choice brands bring a little more money, while in some cases certain brands have been delivered to consumers at a trifle below the figures quoted, but the full difference was due to cheaper freights, doubtful quality, terms of settlement or other conditions. Some fair-sized lots have been taken during the week, but as a rule consumers bought some time ago all the Iron they are likely to want for the next two or three months. This of course works both ways, so that a very active market can hardly be expected for a little while to come. At present, however, there are no indications of pressure from sellers, and prices may be called steady to firm.

Spiegeleisen.—Prices are nominally unchanged, but buyers are not inclined to bid over $36 @ $36.50 for 20 %., c.i.f., duty paid. Sellers ask about $37.50.

Muck Bars.—There is a good demand, but sellers are scarce, and hold at prices varying all the way from $31.50 to $32 at mill, or $32.50 @ $33, delivered. Consumers object to the extreme quotations, but it is hard to get good Bars for less money.

Billets.—There is less disposition to buy at the high prices now asked, so that quotations are more or less nominal. Sellers ask from $38.50 to $39 for Soft Steel Billets, and from that to $55 for the highest grades, delivered in consumers' yards.

Blooms.—There is not much doing, but prices are steady at about the figures named below: Charcoal is quoted at from $54 to $56 ℔ Bloom ton, delivered; Runout Anthracite at $44 @ $45, and Scrap Blooms at $34 @ $36, but there is not much demand.

Bar Iron.—The market is not as active as could be desired, the heavy purchases during November and December having pretty well supplied consumptive requirements for some time to come. It is a curious feature of the position that business which usually goes to the mills is taken by parties who loaded up at low prices and now offer the Iron in competition with the same parties who actually made it. This, of course, is a temporary condition, and one that is not unusual after such a rise in prices as we have had during the past two or three months. In the meantime, however, it paralyzes the market, and leads to more or less irregularity in prices, with the natural result of frightening buyers and to some extent curtailing business which might otherwise be done. Prices are fairly steady at 2¢, at mill, for best Refined Iron, but in some cases sales are reported at less money delivered to consumers free of charge. On the whole, the outlook is somewhat unsettled and concessions are more easily obtained than for some time past. There is more inquiry for Skelp Iron, and sales of 1500 to 2000 tons are reported at about 1.95¢ for Grooved and 2.15¢ for Sheared.

Plates.—There is a fair demand for Plates and mills are in a good position as regards orders. New business has not been of very much importance of late, but there is plenty of it in sight, so that manufacturers are not disposed to concede much on anything that may be offered to them. The difficulty is to get specifications promptly, and in some cases it has been intimated that a little shading would be done for prompt deliveries. Prices are not quotably changed, although they are less firm than they were three or four weeks ago. Quotations are usually given as follows:

	Iron.	Steel.
Tank	2.35¢	2.75¢ @ ....
Shell	2.65¢	3.00¢ @ 3.1
Flange	3.25¢	3.25¢ @ 3.35
Fire-Box	3.75¢	3.75¢ @ 4.25
Angles	2.30¢	2.75¢ @ ....

Structural Material.—There is a continuance of the good feeling reported for some time past. Mills have plenty of work on their books, and there is every indication that the demand will be very heavy during the spring and summer months. Prices as last quoted, viz.: About 2.35¢ @ 2.40¢, delivered, for Iron

Bridge Plate; 2.30¢ @ 2.35¢ for Angles with 20¢ @ 25¢ more for the same in Steel. Tees, 2.8¢ @ 2.9¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—There is no change to report at present. The demand is fair and prices steady at about the figures quoted for some time past, which for carload lots are about as follows:

Best Refined, Nos. 14 to 20.....3.10¢
Best Refined, Nos. 21 to 24.....3.30¢
Best Refined, Nos. 25 to 26.....3.50¢
Best Refined, No. 27.....3.60¢
Best Refined No. 28.....3.70¢
Common, ¼¢ less than the above.
Best Soft Steel, Nos. 14 to 20.....3¼¢
Best Soft Steel, Nos. 21 to 24.....3¾¢
Best Soft Steel, Nos. 25 to 26.....3⅞¢
Best Soft Steel, No. 27.....4⅛¢
Best Bloom Sheets, 1-10¢ extra over the above prices.
Best Bloom, Galvanized, discount.....62½ %
Common, discount.....65 %

Steel Rails.—There is a moderate demand, although sales are mostly in small lots, at from $35 to $35.50, at mill. There is some inquiry for large lots, and prospects are on the whole considered to be quite favorable. The demand for Blooms, Billets, &c., helps the mills considerably, so that there is no urgency to secure orders for Rails unless at full quoted rates.

Old Rails.—The position is about the same as last week. Rails are wanted at $28 @ $28.50 for T's, but there are so few offered that sales are of very little importance. Prices are about the same, whether at interior points or the seaboard.

Scrap Iron.—The amount of business done during the week has not been very large, owing to the difficulty of securing supplies Prices are at about the following figures: No. 1 Wrought, $25 @ $26, Philadelphia, or for deliveries at mills in the interior $26 @ $27 for No. 1 Wrought, $16.50 @ $17 for best Machinery Scrap, $15 @ $15.50 for ordinary, $15.50 @ $16.50 for Wrought Turnings, $11 @ $11.50 for Cast Borings, and $28 @ $30 for Old Fish-Plates.

Nails.—Business is very quiet at present, but prices are steady and likely to be higher as the demand sets in again. Iron Nails are quoted at $2.10 @ $2.20, and Steel $2.40 @ $2.50, but the latter are not called for to any extent at the wide difference in price.

Wrought-Iron Pipe.—There is a very fair demand, considering the season, and prices are well maintained. Discounts as follows: Butt-Welded Black, 50 %; Lap-Welded Black, 62½ %; Butt-Welded Galvanized, 42½ %; Lap-Welded Galvanized, 50 %.

Detroit.

WILLIAM F. JARVIS & Co., under date of January 13, 1890, say: During the week under review an unusual quietness seems to have prevailed in nearly all branches of the trade. There is perhaps a slight weakness shown on Southern Iron. An advance in freights on the 4th inst. of 40¢ ℔ ton has not advanced the price of Pig Iron in an equal proportion, and much larger offerings are being made in the West than heretofore. This is attributable in a measure to the lack of sufficient cars on some of the Eastern roads depended upon by Southern furnaces for carrying their sales in New England and the Eastern market generally from the furnaces to the ports of shipment, the cars being absolutely necessary for other traffic that must be carried without delay. Accordingly, the Southern people are more vigorously seeking the Western market. There has been a fair demand for Ohio Softeners and Strong Iron, which has been quickly met by supplies from those districts. For Lake Superior Charcoal the market is even firmer than a week ago, although no advances have taken place. It is thought that the period of inventory taking will have passed by the 15th and activity on the part of buyers will be renewed. We quote the market, on a cash basis, as follows:

Lake Superior Charcoal, all numbers	$23.00 @ $23.50
Lake Superior Coke Bessemer	25 00 @ 25.50
Katahdin (Maine Charcoal)	26.00 @ 26.50
Lake Superior Coke Foundry, all ore	22.50 @ 23.00
Lake Superior Coke Foundry, cinder mixed	20.25 @ 20.75
Standard Ohio Blackband	21.00 @ 22.00
Southern No. 1	20.50 @ 21.00
Southern Gray Forge	19.25 @ 19.50
Jackson County (Ohio) Silvery	19.50 @ 20.00
Old Car-Wheels (nominal)	21.50 @ 22.50

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, January 13, 1890.

Pig Iron.—The general condition of the market remains about the same as last reported, although the demand so far has not been up to what it was two weeks ago. Prices, however, are fully as firm as at any time, but very few of the Southern furnaces have any Iron to sell for quick delivery, and where quotations are asked for the general reply is a basis of $16 @ $16.25 for February, March and April delivery. Some are declining to contract for delivery this side of May, so it would appear to be quite evident that some of the furnaces are not anxious to make sales and are in a condition to "wait awhile." There is some difference of opinion as to the prices that will rule later in the year. Some contend that July will see prices lower than they are now, while there are those not wanting who predict that prices will rule from July to December on a basis of $20 @ $25 at the furnace bank, f.o.b. There appears to be more activity than ever among the Southern foundries, judging from the amount of Iron they are taking, which is now more than ever before.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, January 13, 1890.

Pig Iron.—There is no change to report in the conditions governing this department. The week under review has been characterized by extreme quietness, and sales were generally of a light character. The curtailment in the demand is not altogether unexpected, as furnacemen always look for a falling off in consumption during this month Prices, however, show no weakness. It is reported that speculators have sold some little Iron within the past week at a trifle less than prices quoted herewith. While this, in a measure, may be true, it is probable if an order was placed for a good, round lot that the present rates would be considered by the seller as too low, and a general advance would be in order. At the moment the market is in a sensitive condition, but with an increased demand, which can be safely counted upon within the next two or three weeks, the market will regain the buoyant condition for which it was noted during the last three months of the year just closed. For ordinary-sized lots we quote as follows:

Southern Coke, No. 1 Foundry,	$19.00 @ $19.50
Southern Coke, No. 2 Foundry,	18.50 @ 19.00
Southern Coke, No. 3 Foundry,	18.00 @ 18.50
Gray Forge	17.50 @ 18.00
Ohio Softeners	20.00 @ 20.50
Lake Superior Charcoal	24.00 @ 24.50
Missouri.	
Charcoal Foundry, No. 1	21.50 @ 22.00
Charcoal Foundry, No. 2	20.50 @ 21.00
Tennessee.	
Charcoal Foundry, No. 1	19.75 @ 20 50
Charcoal Foundry, No. 2	19.00 @ 19.50

Connellsville Coke, f.o.b. East St. Louis. $5.25; St. Louis, $5.40.

Bar Iron.—The demand keeps up well for the season, and full prices are reported as ruling, as follows: Small lots from store 2.15¢. Lots from mill command 2¢.

Barb Wire.—The reports received from jobbers indicate that they will soon be in the market to replenish their stocks, which they allowed to run down with the hope of being able to purchase their spring stocks at less money than during November and December. Judging from the present condition of affairs, it is more than likely that higher prices will be ruling within the next 30 days, and it certainly looks as if the figures at present ruling are as low as we are likely to see for some time at least. We quote as follows: Painted, 3.30¢ @ 3.35¢; Galvanized, 3.90¢ @ 3.95¢. Carload lots, 10¢ ℔ 100 lb less than above prices.

Louisville.

LOUISVILLE, KY., January 13, 1890.

Pig Iron.—There has been a fair demand, though the majority of consumers are pretty well filled up for three or four months to come, and are not inclined to pay the increase occasioned by the 40 ¢ advance in freight rates, so few sales have been made. Quotations just received from leading furnaces are on a basis of $19.25 for No. 1 Foundry and $17.75 for Gray Forge, with the new freight rate added, which advances our quotations. While these prices are somewhat above buyers' views at present, it is thought that they represent the views of furnacemen generally. Prices are nominally the same as last week:

Southern Coke, No. 1 Foundry (new classification)	$18.25 @ $18.75
Southern Coke, No. 2 Foundry (new classification)	17.75 @ 18.25
Southern Coke, No. 3 Foundry (new classification)	17.25 @ 17.75
Gray Forge	16.75 @ 17.25
White and Mottled, different grades	15.50 @ 16.50
Silver Gray, different grades	16.25 @ 17.25
Southern Charcoal, No. 1 Foundry	18.50 @ 19.50
Southern Charcoal, No. 1 Mill	17.00 @ 17.50
Southern Car-Wheel, standard brands	23.50 @ 24.50
Southern Car-Wheel, other brands	19.25 @ 21.75
Hanging Rock Coke, No. 1 Foundry	18.50 @ 19.00
Hanging Rock Charcoal, No. 1 Foundry	22.00 @ 22.50
Hanging Rock, Cold Blast	24.00 @ 26.00

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. CINCINNATI, January 13, 1890.

Pig Iron.—Peace has been declared by the rival Southern companies, and local agents have received instructions to suspend hostilities. These orders have been obeyed, but the result has been to kill business for the time being at least. Prices of Nos. 1, 2 and 3 Southern Foundry Iron have been advanced or restored, as the case may be, to $16, $15.50 and $15 ℔ ton, at furnace, respectively, and Gray Forge is quotable $14 at furnace. The freight rate to Cincinnati is now $3.45, which must be added to these prices to obtain the local basis. But while producers demand these prices, there is no disposition among buyers to meet the higher rates. As yet furnaces show no indication of modifying their position, and consumers who are able hold aloof. Before instructions were received to allow no deviation from the basis indicated there were rumors of sales of upward of 15,000 tons mixed grades of No. 3 Foundry, No. 2 Soft, Silvery and Bright Iron on basis of quotations given a week ago, for six months' delivery; this lot of Iron is not included in the sales already made public, but the report here given has not been verified. It is known, however, that a number of contracts for more or less Iron pending have fallen through since producers have demanded a restoration of prices. It is reported today that a number of small sales aggregating 500 tons No. 1 Southern Foundry have been sold at $16 at furnace and one lot of 500 tons do. at $15.90 at furnace,

cash. At the same time, small amounts of Iron, speculative holdings, have been sold on the basis of a week ago; 100 tons No. 3 Foundry selling to-day at $17.50, four months. It therefore seems that the strong attitude assumed by the large producers has given the smaller and more anxious furnaces an opportunity to sell. How long this may continue is a question. Either furnaces must relax or consumers relent, if not repent of present opinions. The impression at the moment seems to favor a compromise and that the market will assume a position between what sellers ask and what buyers are now willing to pay. Under the present conditions and in the absence of sales of moment quotations cannot be fully reliable. The following quotations are about the trading figures, for cash, f.o.b. Cincinnati:

Foundry.

Southern Coke, No. 1	.....	@	$19.00
Southern Coke, No. 2	.....	@	18.50
Southern Coke, No. 3	.....	@	18.00
Ohio Soft Stone Coal, No. 1	.....	@	18.50
Ohio Soft Stone Coal, No. 2	.....	@	18.00
Mahoning and Shenango Valley	$18.00	@	....
Hanging Rock Charcoal, No. 1	21.00	@	23.00
Hanging Rock Charcoal, No. 2	20.00	@	22.00
Tennessee and Alabama Charcoal, No. 1	19.00	@	19.50
Tennessee and Alabama Charcoal, No. 2	18.50	@	19.00

Forge.

Gray Forge	.....	@	17.50
Mottled Neutral Coke	.....	@	17.00

Car-Wheel and Malleable Irons.

Southern Car-Wheel	24.00	@	24.50
Hanging Rock, Cold Blast	22.00	@	25.00
Lake Superior Car-Wheel and Malleable	22.75	@	23.00

Manufactured Iron—A strong tone has prevailed and prices have been again advanced 10¢, but there has been no special activity.

Nails.—The market has ruled firm with a fair demand, and prices are higher. Iron and Steel Nails, 12d to 40d, sell at $2.40 @ $2.50 ℔ keg, with 10¢ rebate in car lots, at mill; 50d to 60d at 25¢; 10d, 10¢; 8d and 9d, 25¢; 6d and 7d, 40¢; 4d and 5d, 60¢; 3d, $1, and 2d, $1.50 ℔ keg more; Steel Wire Nails sell at $3.10 @ $3.20 for 60d.

Old Material.—The market has ruled quiet, and prices have remained nominal. Old Rails are quotable at $27 @ $28, and Old Wheels are nominal at $19.50, cash, at Cincinnati.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, January 15, 1890.

American Pig.—The volume of business has been moderate during the week. The flurry in the West, due to the contest for business between two large Southern companies, was not reflected by any urgent offerings at lower prices in this market. It is reported that representatives of the companies in question have met and have agreed to maintain prices. The lot of Soft warrant Iron offered in this market last week has been taken care of. Southern Iron is now offered in this market on the basis of $20 for No. 1. We quote No. 1 Foundry $20 @ $20.25 and No. 2 $19 @ $19.50. Forge is held by the majority of sellers at $18, the pressure to place Iron by one seller having abated.

Spiegeleisen and Ferromanganese.—Spiegeleisen is dull and quiet, at nominally $37 @ $37.50 for 20 %. Ferro is selling in a moderate way at $95 @ $96 for forward delivery.

Wire Rods.—A moderate business is being done, chiefly, however, by Western mills, where the quotation continues $51; New York delivery of domestic Rods may be quoted $55 @ $55.50.

Billets and Blooms.—The market is very quiet in the East and quotations are entirely nominal. The chief anxiety of buyers is to secure the delivery of Billets contracted for months ago. We note a sale of 1000 tons of Blooms, quick delivery, by an Eastern Rail mill, to a works in Johnstown, at $34, at sellers' mill. Wheeling has offered Nail Slabs at $36.25, at sellers' mill.

Steel Rails.—The market is quiet, although there are some slight symptoms of uneasiness. We note a sale of 5000 tons by an Eastern mill to a Southern road, and 5000 tons to the New York, New Haven and Hartford by an Eastern mill. There are rumors that there have been heavy transactions in the Chicago market, one report placing the aggregate of sales during the last ten days at 80,000 tons. We quote $35 at Eastern mill for standard sections. A leading Eastern works has advanced quotations for Light Rails to the basis of $35.50 for standard sections.

The Passaic Rolling Mill Company, Aldrich Court, this city, announce the completion of their new open-hearth plant, which consists of two 20-ton furnaces with blooming mill and all modern appliances, thus doubling the capacity of their works. As soon as all the rolls are completed they can furnish 4 to 20 inch Beams, 4 to 15 inch Channels, 1 to 6 inch Angles. They also make Open-Hearth Billets of any desired size and chemical analysis for special work.

Financial.

Though favored by easy money and the best bank statement for many months, the stock markets have been dull and weak. Sugar certificates declined to the lowest point yet touched, and a large proportion of the listed stocks were lower than the week before. The coal stocks suffered from the effects of mild weather, although Delaware and Lackawanna and Delaware and Hudson were notable exceptions. The Reading directors decided that as no interest had been earned none should be paid on the preference bonds. Despite the odium thus excited the ticket headed by Austin Corbin for president was elected, making the sensation of the week in stock operations. On Tuesday the market was dull and wholly lacking in features. The Grangers were influenced chiefly by the favorable reports from the meeting of the Interstate Commerce Railway Association. Harmony prevailed, and a committee of three, consisting of Chairman Aldace F. Walker and Messrs. Faithorn and Midgley, were appointed to prepare a plan to perpetuate the organizarion.

The bond market was active and United States bonds were firm at the following quotations:

U. S. 4½s, 1891, registered	104¼
U. S. 4½s, 1891, coupon	104½
U. S. 4s, 1907, registered	126
U. S. 4s, 1907, coupon	126
U. S. currency 6s, 1895	116

The market for foreign exchange was easier, but posted rates were not changed. The rates for actual business were $4.82 @ $4.86½.

The January disbursements were reflected in Saturday's bank statement, which showed an increase in surplus reserve of $4,259,700. The reserve is now $6,008,700. In loans there was an expansion amounting to $657,700. Specie increased $3,255,200 and legal tenders $2,280,100. Deposits increased $5,102,400. Money was fairly easy throughout the week, but trust companies and banks did not loan on call at less than 6 %. There was a brisk demand for time loans at about 6 % for four to six months on undoubted security. Commercial paper was in fair demand and the supply was increasing. Quotations were 5½ % @ 6 % for 60 to 90 days and 6 % @ 7 % for longer dates. Complaint was made of the scant issue of silver certificates, with the alleged object of forcing the surrender of United States bonds by the national banks. How far the Administration approves of Secretary Windom's silver programme remains to be seen, and as the President has made no communication on the subject it is assumed that he has not yet reached any definite conclusion. It is conceded that with reference to an international coin, it is hedged with difficulties, yet it is being carefully considered by the committee on the subject. Fears are expressed that if a coin were adopted of a nominal value above its worth in silver and guaranteed by the credit of the nations in the league it would depend for its maintenance at par mainly upon the substantial credit of the United States.

The State Railroad Commissioners suggest important legislation in their report just submitted to the Legislature. While there has been less disturbance among railroads than during the preceding year, due in part to the long and short haul clause in the Interstate Commerce act, many abuses exist which it is hard for the State to reach, such as the intentional delay in the return of freight cars, the permitting favored customers to use freight cars as warehouses and the reduction of rates to an unduly low point on certain articles—as, for instance, soft coal—in order to crush out or bring a competitor to terms. The uncertainty of the adjustment of differentials has a tendency to the absorption of the weaker roads by the stronger or the general consolidation of roads in groups. The gross earnings in 1889 were $153,537,208.19, as against $152,122,705.73 in 1888.

The annual report of the Banking Department of the State of New York was transmitted to the Legislature by the new superintendent, Charles M. Preston. The total resources of the State banks on September 7, 1889, were $245,163,888. The increase in banking capital during the fiscal year ending September 30, 1889, was $2,620,000. Twenty-two new banks were authorized to do business, with an aggregate capital of $2,675,000. Ten of these banks, with a capital of $1,500,000, are situated in New York and Brooklyn. Three of the 22 were converted from national banks. Concerning private bankers the report recommends that persons doing a banking business not under the supervision of the department should be obliged to use the word "private" in their business, style and title; also that "no bank should be allowed to make a loan upon its own capital stock as collateral security until such bank shall have a surplus equal to at least 25 % of its capital stock."

The foreign commerce of New York shows a steady expansion, both as to imports and exports. The year 1889 gives us the largest volume of merchandise ever landed at the port of New York. The total included $329,210,894 dutiable and $163,820,087 free goods, in all $493,030,981 of merchandise, exclusive of specie. The largest previous total was in 1882, when there was landed here $492,233,986, not reckoning the specie. As the imports are all entered at their foreign cost, not including either freight or duty, at least $160,000,000 must be added to the value above represented to show their cost to the importers when placed on this market. The exports show gains still more remarkable, particularly during the month of December. For the year the aggregate, exclusive of specie, was $345,859,000, as compared with $299,890,000 in 1888. The total exports were $417,545,010, as compared with $345,500,000 for the previous year. For the entire United States there was a balance of trade in our favor, up to the close of November, equal to $78,685.

There is little improvement in general merchandise, destructive wind-storms in the West and interrupted telegraph com-

munications having had a retarding influence. Breadstuffs are slow. Wheat on the spot weak and irregular, exports nominal. Cotton spot, $\frac{1}{16}$¢ lower. Coffee firm. The shipments of provisions from Atlantic ports last week were large, those of lard simply enormous, reaching about 45,000 tierces, or 14,582,862 pounds, while of bacon fully 13,400,000 pounds went out.

Additional large quantities of breadstuffs and provisions would be forwarded, especially to the United Kingdom markets, were there berth accommodations. A glut of 1,400,000 bushels of grain at Baltimore is aggravated by the burning of the Northern Central elevator. In dry goods trade was stimulated by the presence of large buyers from different sections of the country in quest of spring fabrics.

The eastbound freight shipments from Chicago last week were by far the largest ever known. The movement by all the roads aggregated 131,793 tons.

The bank clearings of 45 cities last week show an increase of 15.6 %. Outside of New York the increase was 11.9 %. New York increased 17.4 %.

Imports for the week at this port were $11,915,700; exports $7,659,000; exports of specie $548,700. The exports of oil for December were valued at $4,493,776 and of cotton $41,925,676.

Metal Market.

Copper.—At the time of our last week's report London cabled spot £51. 5/ and futures £51. 10/, the quotation to-day being respectively £50. 7/6 and £50. 15/, sales aggregating during the interval 1400 tons. Here the market has been moderately active at 14¼¢ @ 15¢ Lake and 13¢ @ 13¼¢ casting brands, closing at 14½¢ Lake. In their review of January 1 Messrs. James Lewis & Son, Liverpool, remark: "According to our estimate during the nine months that have passed since the collapse of the French syndicate the stock then held on their account has been reduced from 179,000 tons to about 110,000 tons, the reduction in the public stocks being 25,000 tons, or from 118,000 tons to 93,000 tons, and in the invisible stocks 44,000 tons, or from 61,000 tons to 17,000 tons. The consumptive demand continues exceptionally good and with the new year will probably increase still further, so we may look for a further considerable reduction in the stocks for some months to come." During 1889 Liverpool and Swansea have imported 30,222 tons Fine from the United States, against 25,150 in 1888 and 16,437 in 1887. Chili's exports amounted to 24,792 tons Fine, against 32,296 in 1888 and 31,217 in 1887. The following is received from Boston: "The eight Boston dividend-paying Copper stocks now have an aggregate market value, applying the highest prices of late to the total of outstanding shares, of $46,000,000, an advance of $16,500,000 since the collapse of the French syndicate, and within $9,000,000 of the highest aggregate under the syndicate control of the Copper market."

Tin.—On the 9th inst. the London quotation was £95. 15/, spot, and £95. 17/6, futures. This morning it is respectively £94. 2/6 and £94. 15/, sales summing up during the interval 760 tons. Our own market has been unusually lively, some 500 tons changing hands at a gradual decline of 15¢ ₱ 100 lb in spot and futures, the former closing to-day at 20¼¢. Messrs. Gilfillan, Wood & Co., Singapore, wrote under date December 3: "Supplies keep small, but are expected to increase toward the end of the month, continuing full till the middle of February, when there will be an interruption owing to the Chinese new year holidays." During the first ten months shipments from the Straits Settlements to the United States have been in 1889–84 respectively as follows, in piculs: 116,353, 47,518, 68,730, 59,121, 23,863 and 55,279. *Tin Plates.*—While the firmness of the market has remained as great as before, there has been less business transacted, without change in prices. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, $5.50 @ $6; Coke finish, $5.20 @ $5.25; Coke Tins, Penlan grade, $4.70 @ $4.80; J. B. grade, $4.80 @ $4.85, and Wasters, $4.60.

Lead.—Sales in the open market were lighter than the previous week, not exceeding 400 tons at 3.80¢, the asking price at the close being 3.85¢.

Spelter—Has been offered more freely from the West, and the little done here has been at 5.40¢ @ 5.45¢. Silesian is again higher in Europe, £24. 10/, which equals 7¼¢ here.

Antimony.—Our market has been quiet at 30¢ for Cookson's and 20¢ for Hallett's.

New York Metal Exchange.

The following sales are reported:

FRIDAY, January 10.	
10 tons Tin, January	20.65¢
10 tons Tin, March	20.80¢
16 tons Lead, February	3 87½¢
25 tons Tin, March	20.75¢
SATURDAY, January 11.	
25 tons Tin, March	20.70¢
25 tons Tin, March	20.65¢
MONDAY, January 13.	
30 tons Tin, January	20.60¢
25 tons Tin, January	20.55¢
25 tons Tin, March	20.60¢
TUESDAY, January 14.	
25 tons Tin, March	20.50¢
45 tons Tin, February	20.45¢
20 tons Tin, April	20.50¢
20 tons Tin, April	20.25¢
(Seller's right to double.)	
25 tons Tin, March	20.45¢
10 tons Tin, February	20.55¢
10 tons Tin, spot	20.50¢
10 tons Tin, April	20.60¢
100 tons Iron, February	$18.87½

Coal Market.

The situation in the Anthracite Coal trade is aggravated rather than improved as the season advances. The proper equilibrium between supply and consumption has not yet been established, so capricious is the range of temperature and so difficult is it to control the output. The official statement of production for the week ended the 4th inst. compared with the corresponding week last year is as follows:

Region.	Jan. 4, 1890. Tons.	Jan. 5, 1889. Tons.		Difference. Tons.
Wyoming.	212,516	195,013	Inc.	17,503
Lehigh....	93,084	95,571	Inc.	17,513
Schuylkill.	140,302	114,675	Inc.	25,627
Totals....	445,902	385,259	Inc.	60,643

The increase here recorded occurs notwithstanding, according to reports, some 20,000 miners are idle. The Schuylkill region, it will be observed, is mining with much freedom, and accumulation at shipping points goes on. The effect is to demoralize prices, which to an unusual extent depend on the shrewdness of buyers. Quotations, therefore, are misleading. The single circumstance in favor of the operators is the extraordinary activity of the iron furnaces and consequent absorption of large amounts of fuel.

Bituminous Coal is in better supply, so that the condition of the market may be considered normal. Prices are easier. Aside from the recent Manhattan Elevated Railroad contract, understood to have been closed at $3.55 per ton alongside in New York, no important transactions are recorded. Nor is there any special eagerness on the part of the companies to secure contracts, in the present situation. Cumberland reports for the week ended January 3 89,861 tons; Clearfield, 64,284; Beech Creek, 42,424; Pocohontas, 32,378.

The Reading Railroad reports that its coal shipment for the week ending January 11 was 125,000 tons, of which 32,000 were sent to Port Richmond and 16,000 tons to Port Liberty. Vessels are reported scarce at Port Richmond, and freights are quoted at $1.30 @ $1.40 and discharge to Boston.

Austin Corbin's annual report of the Reading Coal and Iron Company showed a deficiency of $974,373, respecting which he says: "The inability of the Coal company to earn the entire amount of the fixed charges for the year must be attributed to the low price received for Coal; if the same price had prevailed in 1889 as in the previous year the earnings of the company would have been increased by over $900,000. The expenses of mining Coal, owing to the want of a market for the product of the collieries, were much greater in proportion than they would have been if the collieries could have been operated a greater number of days in the year."

The "philosophy" of the Coal trade is just now receiving attention. A New York contemporary of the 11th inst. speaks of "philosophical calmness," and the Philadelphia *Ledger* of the 13th says there is "more philosophy," and the recognized organ in New York on the 15th speaks of "philosophical resignation," a degree of unanimity which can leave no room for doubt.

Imports.

Hardware, Machinery, &c.

Abrest, Chas., Mach'y, case, 1
Bourke, Graham & Co., Hardware, box, 1
Barbour Bros., Mach'y, cs., 8
Boker, Hermann & Co., Arms, cs., 11
Curley, J. & Bro., Cutlery, cs., 3
Field, Alfred & Co., Hardware, pgs, 5; Anvils, 298
Godfrey, Chas. J., Arms, cs., 5
Graef Cutlery Co., Cutlery, cs., 11
Hartley & Graham, Guns, pgs., 3
Henderson Bros., Mach'y. cs., 15
Kimball, S. D., Anvils, 55
Lau, J. H. & Co., Arms, cs., 4
Matthews, John, Mach'y, case, 1
Pim, Forward & Co., Iron Plates, 72
Probst, F. & Co., Mach'y, case, 1
Schoverling, Daly & Gales, Arms, cs., 8
Stronge, William, Mach'y, pgs., 8
Thurber, Whyland & Co., Mach'y, cs., 9
Werlemann, H., Arms, cs., 15
Ward. Jas. E. & Co., Mach'y, cs., 8
Wiebusch & Hilger, Mdse., cs., 17
Witte, John G. & Bro., Cutlery, cs., 9

The importations of metals, machinery, &c., at this port for the year 1889 are shown by the Custom House reports as follows:

	Quantity.	Values.
Anvils	4,878	38,000
Aluminum	44	9,175
Antimony	273	2,822
Bismuth	83	43,292
Brass goods	1,137	100,116
Bronzes	1,154	132,516
Chains and anchor	1,075	61,829
Clocks, cs	5,314	310,654
Copper	....	129,775
Copper ore	....	1,620
Cutlery	7,838	2,129,880
Dutch metal	783	192,944
Electrotypes	837	28,956
Gold ore	302	11,609
Guns	7,219	880,936
Hardware	44	4,994
Iron, pig, tons	23,778	344,051
Iron, sheet, tons	1,971	166,587
Iron, spie., tons	75,322	1,580,878
Iron ore, tons	24,252	67,634
Iron tubes	400	637
Iron cotton ties	123,128	83,947
Iron, other, tons	42,600	1,220,921
Railroad bars	1,534	1,378
Lead, pigs	5,810	17,875
Lead, sheets	24	805
Machinery	13,223	1,008,160
Mica	513	31,340
Metal goods	27,491	1,741,230
Nails	1,598	5,991
Needles	949	250,827
Nickel	1,003	144,626
Old metal	....	25,990
Platina	146	641,448
Plated ware	1,397	136,010
Percussion caps	529	47,148
Quicksilver	4,751	181,738
Reg. antimony	8,612	284,418
Saddlery	882	130,839
Steel	1,413,131	2,874,887
Steel scraps	4,005	52,463
Spelter, lbs	2,090,511	83,949
Type metal	1,020	3,982
Tin plates, bxs	2,312,171	8,727,302
Tin slabs, lbs	31,853,600	6,499,710
Wire	8,287	266,797
Zinc, lbs	1,016,631	42,355

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

BRAZIL.

PARA, January 10, 1890.—*India Rubber*—Unaltered; exchange advanced ⅛d. After 20th inst. receipts are likely to fall off 30 %.—*Per cable direct.*

EAST INDIES.

MANILA, January 6, 1890.—*Hemp*—Remains firm at $14.50 @ $15 ₱ picul, equaling ₱ ton, cost and freight, £46. 5/, against £51. 10/ same date last year. There cleared for the United States since last cable, January 1, 15,000 against 8000 in 1889; loading, none, against 22,000. Cleared for England since January 1. 13,000 bales, against 4000, loading for ditto, none, against 3000 bales. Receipts at all ports since last cable and January 1, none, against 7000 bales in 1889 and 8000 in 1888. *Freight*—$5, against $7.50. *Exchange.*—3/5⅛, against 3/8¼.—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street*

PENANG, November 28, 1889.—*Tin.*—Fortnight's receipts amounted to 12,500 piculs, out of which Europeans took 5000 and Chinese 7000. The market opened at $34.70 ₱ picul, and after decline to $33.92½, closes to-day at $34.25. *Gum Benjamin.*—Dealings have been of little account at $45 @ $56 for Nos. 1 to 2.—*Schmidt, Kustermann & Co.*

SINGAPORE, December 3, 1889.—*Tin.*—Our last report was dated 18th ult., since when Tin has fluctuated in sympathy with London, the value being steady as we write at $34.37½. Supplies keep small, but are expected to increase toward the end of the month, continuing full till the middle of February, when they will fall off owing to the Chinese New Year holidays. *Gum Copal* has been contracted for forward delivery at $11 ₱ picul for fair native scraped, and there is generally a better demand. *Gum Damar.*—Sales of fair Palembang have been made at $20 ₱ picul. *Tonnage.*—Steamer rates to London have given way to 25/ for dead weight, but there is not much cargo offering. For New York the position is unchanged. For Boston no further fixtures have so far been reported. *Exchange*—Is firmer again at 3/3⅞ for six months' credit drafts. During the first ten months shipments to the United States reached 116,359 piculs, against respectively 1888-84, 47,518, 68,730, 59,121, 33,863 and 55,279.—*Gilfillan, Wood & Co.*

SPAIN.

BILBAO, December 21, 1889.—*Iron Ore*—Has been flat and inactive at 8/6 to 8/10 Rubios Superiores, and 9/ to 11/3 Campanil, There is quite a fleet of steamers flocking into port to fulfill their charters before the close of the year. Shipments, in spite of the untoward weather, have amounted for the week to 70,846 tons, and there are besides loaded ready to leave so soon as the sea permits, 27 steamers and three sailing vessels with a total of 46,000 tons of ore on board. *Pig-Iron.*—Coastwise 165 tons were shipped and abroad 1020. Iron Ore shipments since January 1 sum up 3,761,966 tons, against 3,534,646 in 1888 and 4,084,764 tons in 1887.—*Bilbao Maritimo y Comercial.*

BELGIUM.

BRUSSELS, January 4, 1890.—*Iron.*—There is a lull and some irregularity in quotations, notably of Pig, in consequence of some realizing slightly below the market by speculative holders, especially Germans, Thus a Frankfort firm has commenced throwing 30,000 tons on the market. Meanwhile all Belgian Iron works are well booked for months ahead, hence all finished Iron and Steel Rails remain firm and even tending upward. Merchant Iron is 18 francs the 100 kilos.—*Moniteur des Interêts Materiels.*

Several Delaware capitalists have organized a company with $1,250,000 capital, all paid in, to build an industrial city at Piedmont, Ala., with Preston Lea, of Wilmington, Del., president and William G. Ledbetter, of Anniston, vice-president. $200,000 worth of town lots were sold within an hour from the beginning of the sale.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, January 15, 1890.

Speculation in Pig-Iron warrants was very active during the early part of the week, and prices showed a smart advance under the stimulus of anticipations of a strong position being shown at the quarterly meetings. This expectation was realized in a good measure, but many holders have taken advantage of the opportunities to sell at a profit since the meetings, and a large business has been done at irregular prices the last few days. Exports of Pig Iron to the United States during December were 10,000 tons, against 8000 tons during the corresponding month of 1888. Warrants sold to day at 61/ for Scotch and 60/3 for Middlesborough. Makers' brands are somewhat lower, in sympathy with the decline on warrants, and the volume of business is only fair.

Manufactured Iron of all classes has been strong at the advanced prices made at the quarterly meetings and a large business consummated.

Of Tin Plate there has been quite active buying at makers' prices, and the market is strong. All the works are very busy and makers express confidence in higher prices, being nowise alarmed at the heavy stock at shipping points. The December exports to the United States were 21,000 tons, or about the same as in December, 1888.

Block Tin has ruled much lower on an active business, speculative and otherwise. Heavy shipments from the East have been absorbed, leaving but little accumulation of stock in importers' hands. Large quantities are due to come forward during the next few weeks, but a large part of the same is said to have already been sold on our market.

For Copper the trade demand has been good, but gives some indication of slackening, and consumers consider present prices too high. The narrowing down of the premium on forwards is looked upon as indicating that there is more available Copper in the hands of the public and heavier accounts open for a rise at present than for a long time past. French financiers continue to get rid of their holdings as opportunities offer.

Scotch Pig.—Though not as active this week as last, business has been very fair. Prices are slightly lower on most brands.

No. 1 Coltness,	f.o.b.	Glasgow	80/
No. 1 Summerlee,	"	"	78/6
No. 1 Gartsherrie,	"	"	79/
No. 1 Langloan,	"	"	78/6
No. 1 Carnbroe,	"	"	65/
No. 1 Shotts,	"	at Leith	80/
No. 1 Glengarnock,	"	Ardrossan	77/6
No. 1 Dalmellington,	"	"	71/
No. 1 Eglinton,	"	"	65/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—There has been only a moderate trade, and makers' prices are lower, in sympathy with warrants. No. 3 Middlesborough quoted 61/6 for prompt.

Bessemer Pig.—In this article there continues to be an active trade and prices are firmly held. West Coast brands, mixed numbers, now quoted at 82/6, f.o.b. shipping point.

Spiegeleisen.—Sellers offer very sparingly and little or no concession on last week's prices is made. English 20 % quoted 130/, f.o.b. at works.

Steel Rails.—Makers hold prices very firmly and the demand continues good. Heavy sections quoted at £7. 5/ and light sections £7. 12/6 @ £8, f.o.b. at N. W. England shipping point.

Steel Blooms.—There is little doing in these, and prices as quoted are nominal. We quote £6. 15/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand has continued brisk, and makers are very firm at previous prices. Bessemer, 2½ x 2½ inch, £7, f.o.b. at N. W. England shipping point.

Steel Slabs.—For these demand is moderate, but makers' prices remain unchanged. Bessemer, £7. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—There has been only a moderate trade and buyers and sellers are still apart on prices. Tees quoted at £3. 15/, and Double-Heads, £4, f.o.b.

Scrap Iron.—The market has remained quiet and prices are unchanged. Heavy Wrought quoted £3 @ £3. 5/.

Crop Ends.—Trade continues moderate and prices remain as before. Bessemer quoted £3. 12/6 @ £3. 15/, f.o.b.

Tin Plate.—There has been a fairly active business and makers' prices remain very firm, particularly for Cokes. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	17/6 @ 18/
IC Bessemer Steel, Coke finish	16/6 @ 16/9
IC Siemens " " "	16/9 @ 17/
IC Coke, B. V. grade	16/ @ 16/3
Charcoal Terne, Dean grade	14/6 @ 15/

Manufactured Iron.—All descriptions are firm at last week's advance, and business is fairly active. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	10	0	0	@	0	0	0
" Common "	8	15	0	@	9	0	0
Staff. Bl'k Sheet, singles	0	0	0	@	10	15	0
Welsh Bars (f.o.b. Wales)	8	7	6	@	8	12	6

Copper.—The market rather weak and only a fair business passing. Chili Bars quoted at £50. 5/, spot, and £50. 15/, three months' futures. Best Selected, £58.

Tin.—Considerable pressure to sell and the market unsettled and irregular. Straits quoted at £94. 2/6, spot, and £94. 12/6 for three months' futures.

Spelter.—Prices very firm and business fair. Quoted at £24. 12/6 for Ordinary Silesian.

Lead.—Demand has slackened and prices are rather weaker. Quoted at £13. 17/6 for Soft Spanish.

During 1889 the railroad construction, in what is technically known as the West, amounted to but a trifle over 1700 miles, according to the figures now at command. While hundreds of miles of new road were projected in what might be called the infant States, as well as in the older Commonwealths, where the facilities of some regions are not what they should be, comparatively little has been done except in the new State of Washington. The outlook for 1890 is uncertain, but several important enterprises are under consideration. The more notable instances of building for the present season include the extension of the Chicago, Burlington and Quincy line from Alliance, Neb., to the Black Hills region, a distance of 200 miles, which gives the Burlington access to the great coal fields of Wyoming; the construction of the Union Pacific into Spokane Falls, the completion of the Spokane and Northern from Spokane beyond Colville, and the building of Canfield's Bellingham Bay road from Seattle to a connection with the Canadian Pacific at Blaine.

MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

Cleveland.

Buyers are now asking for No. 1 Foundry Iron all Lake ores in liberal quantities, and $19.50, cash, at the furnace, is readily paid. Prices for mill Irons have advanced slightly. Eastern furnacemen are demanding Bessemer ores, but their orders will not be filled until after the annual meeting of the mine-owners in January.

Philadelphia.

There is nothing to report beyond what was said in yesterday's letter. The market is dull, but there is so little stuff for sale that prices are not affected to any appreciable extent. Holders show no loss of confidence in the position, although the continued dullness attracts some attention.

Pittsburgh.

Some well-informed brokers report Bessemer Pig Iron weakening, increased offerings and but few buyers. It is said that a number of furnaces have changed from Gray Forge to Bessemer, the effect of which has been to weaken the latter. It is claimed that Bessemer is now being offered at $23.75 @ $24, cash, delivered at mill of buyer in Pittsburgh, without finding takers. Muck Bar weak, dull, being offered at $31, cash, and it is intimated might be bought at $30.50. Some kinds of finished Iron have been advanced; Bars now quoted at 1.95¢ @ 2¢ and Plate Iron to 2.50¢ @ 2.60¢. Sheared Bridge Steel has been advanced to 2.90¢. Steel Plates, higher Fire Box, 4¼¢ @ 4½¢; Flange, 3½¢, shell, 3¼¢; Tank, 2.90¢. Bessemer Steel Billets in active demand and very firm, $37 @ $37.50. Old Iron Rails stiff at $29, but there are very few buyers here at present. Oliver Bros. & Phillips, who were forced to ask for an extension five years ago, announce to their creditors that they will pay the last installment when due, February 1 next, with interest.

Chicago.

The heaviest transaction reported for the past week was the Alley elevated railway contract, which is confirmed by parties interested. The Keystone Bridge Company, of Pittsburgh, secured the order, with vigorous competition from other sources. Three miles and a half of double track will be built, requiring 8000 tons of bridge stuff. The first mile is to be completed by March 26, and the balance will be put through rapidly, although full particulars have not yet been agreed upon. Other contractors will erect the masonry. Business in Pig Iron, Scrap Iron, Old Rails and Old Wheels has been quiet, but inquiries are coming forward which are expected to lead to considerable trade, and prices are firmly held at our quotations. Now that the first two weeks of the year have passed much more activity is looked for —in fact, railroad business already shows signs of animation. Orders for cars are being put out for bids, and other material promises to be in excellent demand. Good Bar Iron and Steel orders are in the market. Nails are quiet, but inquiries are increasing for both Cut and Wire, and a revival of trade is looked for at an early day. Barb Wire is somewhat irregular and all dealers and manufacturers are not adhering to the 2.45¢ rate recently named here for small lots, but some have been selling at the old price. It is believed that this will be corrected by February 1, when the usual spring demand sets in.

St. Louis.

There are no interesting features to report; dullness prevails and the outlook for an early revival of trade is not as bright as some wish for. Consumers are buying only in moderate quantities on the basis of $19, $18.50 and $18 for Nos. 1, 2 and 3 Foundry respectively. Gray Forge is quoted at $17.50. Barb Wire and Bar Iron are quiet, but firm.

The Car Stove.

In New York State the car stove has been discarded, in compliance with requirements under the new law now in force. The company that uses stoves in its passenger cars now is guilty of a misdemeanor, and is liable to a fine of $1000 for each offense, and a further penalty of $100 for each day during which such offense is continued. Various systems of heating by steam have been adopted, but none are yet perfect, and there are many complaints. The New York Central has adopted the Master system, which is a simple arrangement of pipes along the sides of the car, with spurs or elbows projecting under the seats and a connection through the floor at the center with the main or feed pipe beneath. All the pipes dip toward a common center so that the water formed by condensation drips into a trap, which by a peculiar mechanism opens and shuts automatically, always remaining closed while the steam is on and opening as soon as it is cut off, thus having the quality of being steam-proof without being water-proof. The device is operated by the difference in expansion and contraction between a brass cylinder and a cast-iron frame supporting it. By its use the pipes are kept clear of water and the steam, coming as it does from the dome of the engine, is always dry. At the point where the main or feed-pipe is connected with the piping in the car there is a three-way valve, by the simple turning of which the steam may be cut off without interfering with or in any way affecting the rest of the train. No part of the numerous systems in use has given more trouble and less satisfaction than the couplings. None has been known to perform its functions properly when subjected to a crucial test on sharp curves and rough pieces of track. They are bound to leak. The Martin coupling, a telescopic affair with ball joints, has been discarded by the New York Central management on this account, its place being taken by an invention of Mr. Buchanan, which comes very near filling the bill. Its main features are a ball and socket elbow joint and a swivel and thread connection with the feed-pipe, which give so much play that a train might turn a corner without springing a leak. The steam is taken from the dome of the engine through a ¼-inch pipe at a pressure of 120 to 180 pounds to the square inch, but passes through an automatic reducing-valve, which lowers the pressure to 5 pounds. A broken pipe in a car with 180 pounds of steam on tap would mean suffocated and scalded passengers; with only 5 pounds pressure no harm would ensue. Engineers say that they do not notice any drain on the engine. No extra stops are made for water and no more coal is burned than before the system was adopted. The cost of the entire new equipment for the New York Central Railroad was $280,000 or about $230 a car. The New York, New Haven and Hartford road still clings to the old Baker heater. The Delaware, Lackawanna and Western Railroad has adopted the Gould system, the same as is used on the Brooklyn elevated roads, but it has been applied only to through trains and a limited number of passenger cars used on the part of the road that is operated in this State.

Good Heating Furnace Work.

The banner work on heating steel has been done at the Joliet works of the Illinois Steel Company, where on one single turn during February last, two furnaces, with working hearths 7 x 18 feet, designed by the Alex Laughlin Company, of Cleveland, heated all the steel necessary to produce 204,240 pounds of No. 5 wire-rods. During the month of March, 11 consecutive turns gave an average product from these two furnaces of 182,000 pounds each turn. During the month of June, the largest week's work was 940 gross tons. The largest single turn was 215,050 pounds, and no turn during this week was less than 191,000 pounds. We believe the feat of heating 96 gross tons cold 4 x 4 inch billets in two furnaces in 11½ hours has never been paralleled.

The best work we have heard of on iron has been done on a furnace with working hearth 7 x 14 feet built by the Alex Laughlin Company for the 9-inch guide-mill at the Lake Erie Iron Works, Cleveland. This furnace has for the past six months actually averaged over 50,000 pounds finished-iron for every single turn, some of the best turns being over 60,000 pounds, while when the smaller sizes, such as ½-inch round are rolled, a production of 42,000 pounds of finished-iron has been made with ease. We think this beats the best record made heretofore on a furnace with only 98 square feet working-hearth, especially as the piles rolled were made from old rails and scrap.

Lake Copper Shipments.—The Portage *Lake Gazette* gives a list of shipments of copper from that port during the 1889 season of navigation:

	Pounds.
Calumet and Hecla Mining Co.	18,743,943
Tamarack	6,150,904
Quincy	5,400,165
Franklin	5,378,576
Osceola	4,111,543
Atlantic	3,279,311
Huron	2,250,081
Allouez	1,789,514
Kearsarge	1,051,801
Central	1,043,274
Copper Falls	880,149
Peninsula	575,748
National	400,000
Ridge	24,246
Belt	3,798
Conglomerate	995
R. Chynoweth (Evergreen Bluff Mine)	28,773
J. T. Bond (Hilton Mine, 20,087; Adventure Mine, 5822)	25,909
W. P. Raley	4,517
Copper Falls tributers	1,381
Detroit and Lake Superior Copper Company, smelters	6,190
Total pounds of copper	50,150,818

The above does not include Calumet and Hecla copper loaded from scows to vessels. This company did their own smelting. The Clark-Bigelow copper has been smelted at their Dollar Bay Works since summer. In addition to the above, 1,649,815 pounds of manufactured copper were shipped from the Dollar Bay Works. Since lake navigation closed refined copper has been shipped steadily from Houghton by rail at the rate of 10 to 15 cars per day, averaging about 30,000 pounds per car. Rail shipments are expected to continue throughout the winter at about the same rate.

Hardware.

There is but little change in the general situation since our last report. Trade continues moderate in volume, but with indications of an increased demand. A quiet, steady trade is doing, and manufacturers and jobbers generally express themselves as satisfied with the condition of business, especially in view of the maintenance of prices and the prospect for a good season's business. The advances made within the past few months have almost uniformly been maintained and further ones are announced from day to day. The market is especially strong in goods that lie near the raw material, but the strength of the market is also beginning to be manifested in general Shelf Hardware, in several lines of which where prices have been unprofitably low there are indications of somewhat higher figures, even though no advance has been announced. Many of the manufacturers and jobbing houses have sent out their travelers and are beginning to hear from them.

Barb Wire.

The Barb-Wire market in this city is steady and prices slightly higher, quotations being as follows for Galvanized Four Point: Carload lots, 4 cents; 3-ton lots, 4.1 cents, and small lots 4.3 cents, with the usual deliveries.

Wire Nails.

The condition of Wire Nails remains without material change, there being a steady but not especially heavy demand for the goods at the present time. Prices are nominally unchanged, but slight concessions are being made, and the factory price for carload lots may be named as $2.90 to $3. In view of the continued advance in Wire ruling prices for Wire Nails are regarded as reasonable and affording only a moderate margin of profit, and it is expected by some that there will be before long an advance in the goods.

Cut Nails.

The movement of Cut Nails has been quite large, the majority of retailers being quite bare of stocks. There has been some irregularity, however, Cut Nails having been sold in round blocks, for spot cash, at a concession, by a party who had purchased at a lower level. The majority of sellers quote $2.10 to $2.15 for carload lots on dock, for Iron Nails.

At a meeting of the Western Cut Nail manufacturers, held at the office of the Benwood Iron Works, at Wheeling, W. Va., on Wednesday, the 8th inst., the selling card was fixed at a $2.50 basis net, for carload lots. No price was fixed for lots of less size. J. N. Vance, of the Riverside Iron Works, presided at the meeting, which was fairly well attended.

Miscellaneous Prices.

The manufacturers of Wood Planes have withdrawn all quotations made previous to January 1, and now quote their goods f.o.b. factory, instead of delivered, as heretofore, to leading points. They have also done away with the discount of 2 per cent. for cash in ten days. The discounts heretofore prevailing are otherwise unchanged. The trade will recognize this as another evidence of the improved condition of these goods and the understanding which exists between the manufacturers.

Owing to the increased cost of material abroad and also advances in labor the manufacturers of English and German Anvils have very generally advanced their prices about ¼ cent per pound.

The manufacturers of Solid Box Vises are now holding the goods firmly at slightly advanced figures, and discount 50 and 10 per cent. to 50 and 10 and 5 per cent. may be named as a general quotation.

There is no improvement in the market for Sand and Emery Paper, which are still being offered at the extreme figures which have for some time prevailed, and it is thought unlikely that any combination can be effected between the manufacturers of these goods, efforts in this direction having recently failed.

Manila Hemp is held at somewhat higher figures, and it is thought that when the market for Rope opens higher prices will prevail. Some well-advised parties are now placing their orders, but the makers are conservative about accepting large orders.

The Union Metallic Cartridge Company, Bridgeport, Conn., and 19 Maiden Lane, New York, and the Winchester Repeating Arms Company, New Haven, Conn., and 312 Broadway, New York, have adopted a revised list for Wads, which is printed below. All their Wads will hereafter be sold by the thousand, instead of by the hundred, and will be packed 50,000 in a case. The discount remains as before at 20 per cent. and 2 per cent. for cash. The following is the list of the Union Metallic Cartridge Company:

Black Edge, Per 1000.		*Pink Edge, Per 1000.*	
4 gauge	$2.20	4 gauge	$3.00
5 "	1.50	5 "	2.40
6 "	1.40	6 "	2.00
7 "	1.10	7 "	1.80
8 "	0.96	8 "	1.70
9 and 10 gauge	0.82	9 and 10 gauge	1.50
11 to 20 "	0.68	11 to 20 "	1.15

Cardboard.	
7 and 8 gauge	$0.40
9 " 10 "	0.35
11 to 20 "	0.30

⅛-Inch White Felt.	
4 gauge	$8.00
6 "	5.00
7 "	4.50
8 "	4.00
9 and 10 gauge	3.50
11 to 20 "	3.00

¼-Inch Black Edge.	
9 and 10 gauge	$1.25
11 " 12 "	1.10

⅜-Inch Black Edge.	
9 and 10 gauge	$2.70
11 " 12 "	2.40

¼-Inch Pink Edge.	
9 and 10 gauge	$1.75
11 " 12 "	1.50

Special Shot Felt. (Thin black edge, not lubricated.)	
8 gauge	$0.96
9 and 10 gauge	0.82
11 to 16 "	0.68

The Winchester Repeating Arms Company, New Haven, Conn., and 312 Broadway, New York, issue their list in the following form, the discount being the same as that above named—namely, 20 and 2 per cent. for cash:

Price per 1000 Wads. Wads are Packed 250 in a Box, Four Boxes (1000 Wads) in a Package, 50,000 Wads in a Case.

	Felt Wads.		Cardboard Wads.
	Pink Edge.	Black Edge.	
No. 4	$3.00	$2.20	....
No. 5	2.40	1.50	....
No. 6	2.00	1.40	....
No. 7	1.80	1.10	$0.40
No. 8	1.70	.96	.40
Nos. 9 and 10	1.50	.82	.35
Nos. 11 to 20	1.15	.68	.30

White Felt Wads, ⅜ Inch Thick, Packed in Boxes Containing 125 Wads. Four Boxes in a Package.

No. 8	$4.00 per 1000
Nos. 9 and 10	3.50 "
Nos. 11 to 16	3.00 "

There is an improved condition in the Padlock market and the extreme prices which have been prevailing have been withdrawn. Some manufacturers recently issued revised discount sheets, in which higher figures than the goods have generally been sold at for some time past are named, as, for example, Mallory-Wheeler Company quoting discount 75 and 5 per cent., and the Norwich Lock Mfg. Company, under date January 10, discount 70 and 10 per cent.

The prices of Agricultural Wrenches are well maintained, and it is considered not unlikely that an advance will be made before long. Nothing has, however, been decided by the manufacturers in regard to the matter.

It is expected that a meeting will be held at an early day by the manufacturers of Picks, Mattocks and Grub Hoes, when the feasibility of advancing prices will be considered.

The following are the revised prices of the Animal Pokes made by A. W. Bishop, Berea, Ohio:

	Per dozen.
Bishop's IXL	$6.00
Bishop's O. K	5.25
Bishop's Pioneer	3.75
Bishop's American	2.75

Obituary.

Elwood Burdsall, of Russell, Burdsall & Ward, Portchester, N. Y., died at his late residence, near Portchester, December 30, aged 75 years. As a prominent manufacturer of high personal worth with many friends, the announcement of his death has been received with much regret. The esteem in which he was held at home is also abundantly evidenced by the many appreciative tributes which have been paid to his memory. We shall take occasion in a subsequent issue to refer more at length to his business career.

William Clemson, Sr., of the Wheeler, Madden & Clemson Mfg. Company, manufacturers of Saws, Middletown, N. Y., died there on Sunday, aged 69 years. He was the last of the former firm Wheeler Madden & Clemson, which included also Edward M. Madden and Elisha P. Wheeler, both of whom died within a few years.

B. F. Van Vliet, Burlington, Vt., died suddenly at his residence, January 9. He was president at the time of his death of the Venetian Blind Company, manager of the Queen Anne Screen Company and largely interested in the Baldwin & Cheney Refrigerator Company. Mr. Van Vliet had not been at all well for the past two months, but had not been confined to the house until Monday, when he was seized with an attack of influenza, which terminated fatally. His death was both sudden and unexpected. Mr. Van Vliet is referred to as an exceedingly popular man in business circles and had acquired a large circle of friends.

Guarantee of Prices.

QUESTION.—Wholesale agent A ordered in May, 1889, of manufacturer B 100 cases of goods at 50 per cent. discount, order reading "Quantity to be taken by December 31, price guaranteed against yourselves to date of shipment." During the summer the price of these goods declined to 60 off, and remained at this price until about November 1, at which time B's best price was 50 and 5 per cent. discount, that being the price prevailing to-day. A now wants the goods shipped, and claims they should be billed at 60 per cent. B claims that they should be billed at 50 and 5. Which of the two parties to the transaction is right?

In regard to this matter a correspondent in Ohio presents his view of the case as follows:

Referring to question as to purchase of wholesale agent A from manufacturer B, in which price is guaranteed against themselves to date of shipment—viz., May to December 31, it looks to any fair-minded merchant that it resolves itself into this: Your goods were bought at 50 per cent., giving you privilege to order in any time between May and December at any lower

price than this—*i. e*, 60 per cent. when they reach that. If, however, you hold your request to ship until expiration of the time the unwritten law says goods must be billed at their market price, unless that price be less than 50 per cent.—that is, 40 per cent. or 40 and 10 per cent., in which case A is entitled to 50 per cent. or 50 and 5 per cent., if it rules.

Relating to the same matter, a Connecticut correspondent argues as follows:

It is an advantage to B to receive orders early in the season, as it enables him to regulate his production, and for this reason he is willing to protect A in case of a decline, but it would be unfair to compel him to use as a basis for transactions completed in December a price which may have ruled for a short time several months before. His submitting to such a demand would probably depend on the desirability of A's future orders and his fear of losing them. A custom prevails in some branches of the trade which covers points raised by this situation. Where orders are booked far in advance of delivery it gives the buyer the benefit of any decline, but in case of an advance the goods are billed at once and payment is required, but deliveries may be made at the convenience of the buyer. This gives the buyer the benefit of the bottom price and also puts the seller in good shape for new business. It seems a just and reasonable division of the burden which both manufacturer and dealer are called upon to bear.

Items.

The Peters Cartridge Company, Cincinnati, Ohio, have issued a calendar for the present year in which attention is called to their Paper Shot-Shells, which they are now introducing to the public. It is stated that they have completed large factories for their manufacture, and they allude especially to the quality of the Shells, making the point that they are particularly attractive in appearance, strong, accurate, sure-firing and thoroughly water-proof. The attractive picture which is given in their calendar is lithographed on the Shell-boxes. The company allude to their determination to have their Empty Shells stand as high in the estimation of dealers and shooters as their Shotgun Cartridges.

L. M. Dayton, Cincinnati, Ohio, issues a new and convenient price-list showing the manufactures of the Anchor Iron and Steel Works and the American Bolt and Nut Works, Newport, Ky. Attention is thus called to the line of Iron and to Carriage, Tire, Sleigh-Shoe, Plow, Machine Bolts, &c., of his manufacture. The list revised to date is compactly and conveniently arranged, and will be of interest as thus calling the attention of the trade to an important line of goods.

The Salem Wire Nail Company, Salem, Ohio, have discontinued their former agency in this city, and have instead established a branch office at 261 Broadway, under the management of George H. Ismon, for the sale of their product in the Eastern market.

The Hoopes & Townsend Company, Philadelphia, and the Hoopes & Townsend Company, Wilmington, Del., issue a revised edition of their price-list under date December 1, 1889. It is a well-arranged pamphlet of nearly 100 pages, printed in red and black. In regard to the history and relationship of these two houses the following statement is made:

The business of Hoopes & Townsend as manufacturers of Bolts, Nuts, Rivets and kindred articles was established at Wilmington, Del., by Barton Hoopes in 1849. It was removed to Philadelphia in 1852, and the works have been enlarged at various times to give increased facilities for rapid production. In July, 1889, the plant, equipment and business of the Hare & Morgan Company, of Wilmington, Del., were purchased, and will be operated as a separate branch of our establishment under the corporate title of the Hoopes & Townsend Company. Both at Philadelphia and at Wilmington the same kinds of goods are produced.

The firm of Hoopes & Townsend is composed of the following persons: Barton Hoopes, Clement R. Hoopes, Barton Hoopes, Jr., and Dawson Hoopes, with James M. Hibbs as business manager. The officers of the Hoopes & Townsend Company are as follows: Barton Hoopes, president; Clement R. Hoopes, vice-president and treasurer; Barton Hoopes, Jr., vice-president; James M. Hibbs, secretary; Dawson Hoopes, manager; and John Day, superintendent.

Mackinaw Refrigerator Company, 106 Chambers street, New York, have issued their price-list for the present year. It is a well-printed and fully-illustrated pamphlet of 32 pages, in which the special features of their Refrigerators are explained, with a detailed description of the different patterns. A number of attractive styles are thus brought to the attention of the trade. In addition to the other features of these goods, attention is specially drawn to the fact that the Refrigerators are finished in antique ash, and are furnished with Bronze-Metal Locks of novel construction, drawing the doors to a tight joint. A telegraphic code is furnished for the convenience of purchasers.

Horton, Gilmore, McWilliams & Co., hardware and cutlery jobbers, Chicago, are distributing very pretty calendars among the trade. They bear the portrait of a lovely female, together with the compliments of the firm and an incidental reference to Black Diamond Horse Nails, which are sold by this house.

Schulte, Lohoff & Co., Evansville, Ind., have issued an elegant illustrated catalogue and price-list showing the line of Edge Tools of which they are the manufacturers. It relates to Hatchets, Adzes, Boys' and Hunters' Axes, Tinners' Snip-Shears, Carpenters' Pincers, Cleavers, Choppers, Mattocks, Grub Hoes, &c. The cut of the different tools is given on one page, the description and prices being given on the opposite page. The striking feature of the illustrations is the attractive representation of the finish and labels of the Tools, the effect of the color and the gold bronzing being very pleasing. This interesting line of goods is thus brought effectively to the attention of the trade, and the manner in which the catalogue is printed is creditable to the enterprise of the company and the skill of the Keller Printing Company, Evansville, Ind., by whom it was printed. The frontispiece of the catalogue is a view of the works and indicates their extent.

H. W. Hill & Co., Decatur, Ill., issue in unique form a comparative statement of their sales during the years 1888 and 1889, their sales during the past year being given as 16,255,725 Rings, a gain also being reported in the sale of Ringers, both the improved and old style.

M. J. Phalen, secretary of the C. H. Gurney Company, 247 Lake street, Chicago, started for the Pacific Coast on the 11th inst. He will be absent about two months making arrangements for the extension of trade in that direction in some of the specialties for which his firm are Western agents.

J. B. Kubatz, 150 East Ninety-seventh street, New York, illustrates a device by which horses may be instantly released from the fastenings in the stalls in the event of fire or whenever desired without the necessity of the operator entering the stalls or even the building. This is done by means of a mechanical device which is operated by a cord or wire from any desired point.

Chas. P. Holdrege, Bloomington, Ill., who is known to many of our readers as a representative of the Simmons Hardware Company, sends out in appropriate form a New Year's greeting to his customers.

G. & H. Barnett, Philadelphia, Pa., are issuing their calendar for 1890 in combination with a pocket tablet. It is elegantly gotten up with celluloid covers, the second of which is devoted to a calendar for 1890 and the first to a view of their File works.

Winona Wagon Company, Winona, Minn., have issued their No. 6 illustrated catalogue and price-list, showing their line of Rushford Wagons. Of these a number of leading styles are illustrated, with descriptive matter and prices.

The Comstock & Wing Nickel Works, 95 Indiana street, Chicago, have just issued an illustrated catalogue of their productions, which embrace Hardware specialties, Stove Trimmings, Piano Hardware, &c. The line of goods now made by this company is quite extensive and well worthy of being shown in a catalogue. The Hardware specialties consist of Curling Irons of various patterns, Tracing Wheels, Corkscrews, Nut Crackers, Toy Safes, Ice-Box Latches, &c. The Stove Trimmings cover Lifters, Pokers, Knobs, Hinge-Pins, Towel Rods, &c. The Piano Hardware consists of Pedal Feet, Pedal Guards, Thumb-Screws, Bearing Bars, Upright-Action Brackets, &c. After February 15 the company will be installed in their new factory, at 236 to 240 Carroll avenue, to which the office will also be removed.

One of the most elegant and effective calendars which we have seen for the present year is that of Francis Chenoweth & Co., Birmingham, Ala. The calendar proper is neatly printed in red and black and is incased in a leather frame, which is arranged either to hang up or to stand upon the desk. It will be appreciated by those who are fortunate enough to receive it.

Frank E. Fitts, 76 and 78 Pearl street, Boston, Mass., issues a card relating to Machinery Wiping Towels, of which two sizes are made, 14 x 15 and 14 x 30 inches. These Towels are referred to as more economical and convenient than waste.

Essex Horse Nail Company, Essex, N. Y., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, issue striking and attractive calendars for the present year.

Simmons Hardware Company, St. Louis, Mo., have issued their Carriage catalogue for 1890, which illustrates the Whitney Children's Carriages, for the sale of which they are Western and Southern agents. A number of leading patterns are attractively displayed, together with Toy Carts, Express Wagons, Boys' Wheelbarrows, Velocipedes, Tricycles, &c. The quality of the goods is especially emphasized and the point made that these Carriages are really cheaper than others of inferior grade which are sold at a lower price. Several new and attractive designs are among those shown. The company also call attention to their other lines and illustrate their Improved Siberia Refrigerators and other goods.

The Brand Mfg. Company, New Britain, Conn., have changed their name to the New Britain Hardware Mfg. Company. They will continue to manufacture a full line of Piano and Organ Hardware, and have added largely to their equipment and increased their capital for the further development and enlargement of their business. They have added a new depart-

ment for the manufacture of special Machine Screws, Bolts, Studs, &c. T. W. Wilbor is treasurer of the company.

As a seasonable article the trade will be interested in the announcement on page 93 of the Goodell Company, Antrim, N. H., in regard to Pearce's Improved Cahoon Broadcast Seed-Sower. Some of the features of this machine and the extent to which it is used are referred to in the advertisement.

The Commercial Travelers' Association of Indiana met at Indianapolis on the 4th inst. and after disposing of routine business relating chiefly to the mutual insurance feature of the organization, elected officers for the next year as follows: President, James C. Norris, Indianapolis; vice-president, A. S. Blake, Terre Haute; secretary and treasurer, D. W. Coffin, Indianapolis.

Crane Bros. Mfg. Company, of Chicago, manufacturers of Wrought-Iron Pipe and Fittings, have changed their name to Crane Company. They have issued a most artistic calendar for 1890 which they are now distributing.

The Nubian Iron Enamel Company, of Chicago, have issued the initial one of 12 handsome calendar *souvenirs*, which they purpose sending to patrons of Nubian for 1890. A neat little pamphlet accompanies the calendar and is entitled "A Brochure in Black." It contains *facsimiles* in miniature of testimonials received from a large number of consumers.

The trade will be interested in the illustration given on page 55 of Herrick's patent Agricultural Tool Rack, manufactured by F. A. Herrick & Co., Jackson, Mich. The construction of this convenient rack, which accommodates a large amount of goods in little space, while at the same time they are conveniently accessible, is shown in the illustration, and letters are given from several Hardware houses in regard to its convenience and utility.

As relating to a seasonable line of goods the trade will be interested in the advertisements of the different manufacturers of Window and Door Screens and other related lines. This is a department in which much enterprise has recently been exhibited and the sales of these goods have shown a material increase during the past few years. It is not likely that the demand has yet reached its full proportions, and the business of the present year promises to be large.

The J. I. Case Thrashing Machine Company, Racine, Wis., issue a catalogue of the Agitator Thresher, Horse-Powers, Separators, Stationary and Portable Engines, Sawmills, &c., of which they are the manufacturers. The catalogue contains numerous illustrations of the manufactures of the company with exceptionally full descriptive text and gives also some testimonials from persons who have used the machines. The latter portion of the pamphlet is given up to Case's Catechism, which pertains to questions and answers concerning Steam Engines and Boilers. A price-list of machinery accompanies the catalogue.

The Russell Jennings Mfg. Company, Deep River, Conn., have issued a revised edition of their price-list, in which the list prices of their different Augers and Bits are concisely given.

The Wright & Colton Wire Cloth Company, Worcester, Mass., issue a price-list of Galvanized Netting and Wire Cloth. Illustrations and prices of the goods are given, together with information as to the particular uses for which they are designed. This company succeed the Wright Wire Cloth Company, formerly of Palmer, Mass., who were established several years ago by Geo. F. Wright and his two sons. The business thus founded has steadily grown, and additional buildings and machinery becoming necessary it was thought expedient to remove the entire plant to Worcester, and thus secure better railroad facilities. They are also putting in new and improved machinery. The company manufacture large quantities of Galvanized and Plain Wire Cloth, Wire Lathing, Locomotive-Spark Netting, Fruit-Drying Cloth and many other varieties, but their specialty is the manufacture of Galvanized Poultry Netting, their facilities for the production of which are emphasized. They refer to their process for galvanizing Wire Cloth and Netting with pure zinc, obtaining a finish as smooth and bright as tin or silver, and state that it does not injure the texture of the Wire by the use of acids and that the Zinc Coating will not flake off the Wire when bent to and fro. The new company are incorporated with $50,000 capital. They will have the best wishes of the trade for their success in their new departure.

The item in our last issue with reference to the joint announcement of the Palmer Hardware Mfg. Company, Troy, N. Y., and the Empire Portable Forge Company, Lansingburg, N. Y., in regard to the Common-Sense and Empire Sash-Pulleys, should have been supplemented by the statement that the Palmer Hardware Mfg. Company announce that the sale of the Common-Sense Pulleys in New England, New York, New Jersey, Pennsylvania and Delaware is controlled by Peabody & Parks, Troy, N. Y., as heretofore. We are advised also that there will be no change in the price of the goods.

The trade have learned with very much regret of the financial embarrassment of Sise, Gibson & Co, 118 Chambers street, New York, and the Barnes Mfg. Company, New Haven, Conn. On this account the former made an assignment, without any preferences, January 9, to E. G. Stebbins, New York, and on the same date the Barnes Mfg. Company applied for a receiver at New Haven, Minot C. Kellog, of Patterson Bros., of this city, being appointed. Mr. Sise will soon make a Western trip and will be glad to correspond with manufacturers who desire to have their goods represented to the large trade. This will be recognized by manufacturers as an especially desirable opportunity, as Mr. Sise has established connections with many leading houses and is widely and favorably known.

William H. Jacobus, 90 Chambers street, New York, has been appointed agent for the sale of the German Pattern Bits, Gimlets, &c., manufactured by Garritt & Beach, Seymour, Conn. The price-list of these goods is issued in circular form and the list prices given are subject to a discount of 40 per cent.

Henry M. Gay, Milwaukee, Wis., who represented the Biddle Hardware Company in Wisconsin, Iowa, Minnesota and Illinois from 1875 to 1886, inclusive, has re-engaged with them and will be their representative over his old territory. Mr. Gay is one of the oldest Hardware salesmen now traveling in that section, having been "on the road" for 23 years. His old customers will be glad to renew his acquaintance.

Henry Keidel & Co., Hardware importers and manufacturers' agents, Baltimore, Md., finding the premises on German street which they have occupied for many years insufficient for the steadily increasing demands of their business, have removed to the commodious warehouse No. 25 Hanover street, which has been specially fitted up. Here they hope to continue to increase the volume of their business with greatly improved facilities for the convenient exhibition and handling of goods.

Important Auction Sales.

The trade will observe on page 54 important announcements of auction sales of Hardware next week by Haydock & Bissell. From these it will appear that on Tuesday, January 21, at the auctioneers' rooms, 12 Murray street and 15 Park place, New York, there will be a large special sale of Stamped Tinware and Granite and Agate seconds. These goods, which may thus for the first time in many years be obtained at auction, will be packed in cases and will be sold in case lots. Further details in regard to the sale are given in the advertisement. On the following days, January 22, 23 and 24, the entire stock of Gilbert, Sweet & Lyon, who are retiring from business, will be sold without reserve at the store, No. 33 Chambers street, New York. This stock comprises an extensive assortment of Hardware in which staple goods have a large place, and it is referred to as in fine order, including many lines of Hardware which are recognized by the trade as especially desirable. The store fixtures, counters, &c., will also be sold. The auctioneers state that it will be impossible on account of the shortness of the time before the sale to issue their catalogue in advance, but emphasize the fact that the stock of Hardware thus offered is the largest, best assorted and most desirable that has been sold at auction for several years. The catalogue will be ready on the morning of the sale. It is obvious that these sales are deserving of the best attention of the trade, and it is expected that there will be a large representation of buyers present.

Trade.

From Louisville, Ky., we have the following advices under date January 11 in regard to the condition of trade in that market:

The Hardware trade of Louisville, Ky., has begun the new year in good shape. The country generally is prosperous and the retail trade has plenty of money to pay cash for goods, which fact with the good demand suits the jobber exactly, and the accounts between them are in better shape than for many seasons. It has been many years since the wholesale Hardware merchants have had such a profitable fall and winter business, and bright prospects for the current season give further confidence to trade. And yet there has been less speculative buying ahead than usual, which probably has aided the steady advances in some lines of goods. The bugbear of the usual break about July 1 has vanished and a healthy tone of confidence prevails. Stocks are none too excessive with the jobbers, nor have the factories accumulations to threaten trade. There is a happy state of equilibrium, which, it is hoped, will continue. Bar and Sheet Irons are in shape, prices from store being respectively 2 cents, with full extras, and 2.90¢. Bar is offering from mill at 1.92 cents to 2.05 cents, according to freights, the valley mills being at a disadvantage on account of transportation charges. This discrepancy will soon be evened up by the inability of the river mills to fill all orders. Barbed Wire has advanced to $3.95, from mill, and sells at mill, 4¢ from store. Plain Galvanized is firm at 2.75¢ for No. 9. Wire Nails are eagerly sought at $2.85, at mill, and bring $3.10 from store. A sharp advance in them is expected soon. Cut Nails are now firm at $2.50 net rate, at mill, 60 days, 2 per cent. off for cash—for 25-cent average over base. The trade anticipated this advance and some lively buying was done, but orders generally were for immediate shipment and not speculative purchases, with the old-time guarantees against decline, long delivery, &c., giving all the advantage to the merchants. It is probable the mills realized that it would be some time before any orders would come in at the new price of $2.50, and consequently a great many propositions to dealers were left open for days after the meeting. The past experience of the jobbers made them shy of placing heavy orders, and for this the mills can be thankful. An advance of 5 per cent. has been made in half patent Carriage Axles. The general jobbing trade is large for this time of the year, orders coming in unsolicited. The traveling salesmen or drummers are just getting out on the road again, and are met pleasantly by their customers, who are ready to take in a bargain.

Exports.

PER BARK HATTIE H., DECEMBER 23, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By H. W. Peabody & Co.—30,000 pounds Barb-Wire.

By R. W. Forbes & Son.—12 Corn-Shellers, 16 cases Plows.

By Oelrichs & Co.—100 dozen Axe-Handles, 100 dozen Pick-Handles, 800 dozen Sledge-Handles.

By Corner Brothers & Co.—80 dozen Tools, 1000 Plow-Points, 9 Hard-Carts, 12 Dam-Scrapers, 1 box Castings

By Coombs, Crosby & Eddy.—52,500 pounds Barb-Wire, 3717 pounds Rope, 12 dozen Hatchets, 6 Hand-Carts, 123 dozen Handles, 11 dozen Carpenters' Tools, 6 sets Sad-Irons, 18 dozen Hammers, 6 dozen Axes, 9 dozen Tools, 175 pounds Nails, 10 Clippers, 7½ dozen Hardware, 3 dozen Tools, 6 Plows, 3 dozen Plow-Points, 1 dozen Scales, 21 Pumps, 29 dozen Hatchets, 12 dozen Mouse-Traps, 2 Scales, ½ dozen Saws, 2263 pounds Plows, 10,000 pounds Barb-Wire, 6 Scales, 12 cases Sash-Weights, 1 case Sash-Cord, 24 dozen Handles, 6 nests Sad-Irons, 44 dozen Tools, 1½ dozen Blacksmiths' Drills, 5 dozen Hardware, 20 dozen Handles, 6 Pumps, 2 dozen Hardware, 1 Road-Scraper, 11 dozen Hatchets, 96 Plows, 15 cases Sash-Weights, 1 cash Sash-Cord, 8206 pounds Rope, 300 pounds Nails, 84 dozen Handles, 260 Plows, 10 dozen Axes, 1 gross Polish, 3 Store Trucks, 12 Hand-Carts, 10 dozen Picks, 100 dozen Hatchets, 3½ dozen Meat-Choppers, 36 dozen Hardware, 48 dozen Hammers, 4 dozen Scales, 14 Scales.

PER SHIP ROLLO, DECEMBER 23, 1889, FOR BRISBANE, AUSTRALIA.

By A. Field & Sons.—1026 pounds Iron Nails.

By Edward Miller & Co.—34 packages Lamp Goods.

By Manning, Maxwell & Moore.—193 pounds Rail Saws, 7 pounds Rail Saw Blades, 18 pounds Iron Levels.

By Henry Disston & Sons.—1909 pounds Hardware, 975 pounds Saws.

By A. S. Lascelles & Co.—7 packages Lamp-ware, 2 barrels Lampware.

By H. W. Peabody & Co.—56 packages Carriage Ware, 4 cases Plated Ware, 10 cases Lampware, 5 cases Traps, 1 case Edge Tools, 13 packages Picks, 742 dozen Handles, 64 crates Stoves, 33 packages Hardware, 46 packages Lampware, 8 packages Pumps, 730 pounds Barbs, 4 crates drills, 99 packages Hardware, 1 package Carriage-Ware, 2 cases Files, 9 cases Lampware, 17 packages Rifles and Cartridges, 6 cases Perumbulators, 81 packages Pumps, 26 dozen Handles, 2 crates Money Drawers, 1 bundle Registers, 31 coils Hose, 10 dozen Spades, 3 cases Electrical Goods, 1 case Atomizers, 6 crates Churns, 22,414 pounds Barb Wire, 11 cases Hardware, 17 packages Lampware, 4 cases Forges, 1 case Castings, 1 case Tacks, 11 crates Stoves, 3 packages Lampware, 1 case Castings, 1 case Hose, 13 packages Carriage Ware, 5 cases Electrical Goods, 11 cases Iron Castings, 2 cases Wood-Working Machinery, 3 cases Glue, 2 packages Fishing Material, 1 case Agricultural Implements, 41 packages Hay Presses, 1 case Thermometers, 5 packages Mill Machinery, 48 packages Hardware, 6 cases Grindstones, 10 cases Trucks, 35 packages Barrows, &c., 5 cases Drills, &c., 48 crates Stoves, 2 cases Wood-Working Machinery, 20 packages Hay Rakes, &c., 32 packages Shellers, 6 crates Shellers.

By R. W. Forbes & Son.—23 packages Stoves, 30 dozen Hoe Handles, 36 dozen Axe Handles, 3 crates Corn-Shellers, 6 packages Windmills, 2 cases Horse Hoes, 225 pounds Tacks, 60 dozen Axes, 4 cases Meat-Cutters, 4 dozen Braces, 150 pounds Axle Grease, 31 packages Stoves, 1 case Stencils, 6 dozen Axes, 8 dozen Hammers, 6 dozen Sledge Handles, 5 packages Sad Irons, 1 case Lampware, 2 cases Oil Stone, 16 dozen Hammers, 6 racks Churns, 7 packages Hardware, 1 dozen Hammers, 1 package Hardware, 8 packages Lampware, 1 box Machinery, 32 packages Hardware, 6 dozen Snaths, 1 case Perambulators, 10 dozen Axes, 12 dozen Axes, 4 packages Kitchen-Ware, 15 dozen Rake Handles, 2 dozen Bench Screws, 500 Mop Handles, 16 Hatchets, 1 case Fire-Arms, 1 case Horse Hoes, 4 racks Churns, 310 pounds Tire Bolts, 110 pounds Carriage Bolts, 4 packages Barrows, 9 packages Plows, 4 racks Churns, 12 packages Stoves, 6 dozen Rakes, 1 package Lampware, 1 case Trucks, 600 pounds Axle Grease, 1 cask Pumps, 1 case Hammers, 2½ dozen Hammers, 14 racks Churns, 20 packages Hardware, 3 dozen Snaths, 1 dozen Rakes, 2 dozen Forks, 16 dozen Axes, 3 dozen Sad Irons, 12 dozen Axe Handles, 3 dozen Fork Handles, 12 dozen Oilers, ½ dozen Axes, 43 pounds Cord, 3 racks Churns, 125 pounds Hose, 1 dozen pairs Roller Skates, 480 feet Tubing, 9 packages Hardware, 16 packages Plows, 3 packages Kitchen Utensils, 4 crates Churns, 4 packages Hardware, 13 packages Stoves, 7 packages Household Utensils, 6 gross Lead Pencils, 53 dozen Axes, 24 dozen Hoes, 7 cases Plows, 24 dozen Hammers, 25 pairs Skates, 1 case Carriage Bolts, 4 packages Hardware, 2 packages Hardware, 82 pounds Sandpaper, 1 package Hardware, 1 package Nails, 1 box Hardware, 8 packages Hardware, 563 pounds Carriage Bolts, 25 packages Fire-Arms.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Mild weather has been beneficial to the trade in Paints and Colors through facilitating outdoor work in this vicinity and at many points somewhat distant. Besides this, more or less confidence has been imparted by the greater firmness of the market for certain of the more staple pigments and some lines of painters' Colors. Between the actual wants of the moment and a good measure of confidence in providing for future requirements a fairly liberal business has been effected. Jobbers state that their sales the past ten days make a remarkably good showing for the season, and manufacturers and importers also note a satisfactory experience, as far at least as sales of the more staple goods are concerned. About the only weak spot at the present time is in the "insecticide" branch, but the association has fixed prices for Paris Green at so low a point that an improvement is considered more than probable later on. Outside manufacturers of White Lead have been stimulated to special effort by the higher prices fixed by corroders in the trust and the association, but the competition has thus far had no important bearing upon the market. The pigment and house-painters' Colors in general may fairly be termed as firm at the present time.

White Lead, &c.—The trust prices for White Lead are generally adhered to by corroders outside of the combine, as well as those within, and the heads of most establishments report a satisfactory business the past week. The trust net price to buyers of 50 tons in six months is about 6.34¢ for Lead in Oil. This, it is stated, leaves a margin of about $49 ℔ ton over cost, and the latter in turn has stimulated "outside" production. A very good article has been sold and is still offered at 6¢, less 2½ % for cash in 15 days, but the competition has not reached extensive proportions and affects reputable brands little if at all at the present time.

On Red Lead and Litharge there is no variation from the trust prices. Business in the pigments is rather slow, however, and no material change in the movement is looked for prior to March.

Zincs.—The movement of American Oxide in jobbing quantities has been very fair, making a remarkably good exhibit for the season, and manufacturers report a wholly satisfactory market, taking together the current demand and the deliveries on old orders. Prices have undergone no change whatever. There is little doing in foreign Zincs at the moment, but prices for the various brands are firmly held.

Colors.—The Paris Green Association announce, under date of 10th inst., that their prices for the coming season have been fixed at 12¢ for lots of 1 ton or more and 12½¢ for smaller quantities. These low prices were decided upon as a means of retaliation upon outside manufacturers who are held responsible for the breaking up of the rebate system adopted by the association last year. It is stated that the figures quoted barely cover the cost of manufacture. House-painters' Greens are affected little, if at all, by the decline on the "insecticide." Vermilion is firmly held at the recent advance, and for other Reds and Colors generally prices remain very steady.

Miscellaneous.—There is no change whatever in the position of the market for Chalk. Former prices are quoted for Whiting, Paris White and Barytes, with the market steady and the demand good for the season.

Animal and Vegetable Oils.

Business has been rather larger the past week in most lines of Oils, and prices for several descriptions have hardened somewhat, the general market thus showing better form. The changes recorded include none of unusual character outside of Olive Oil, which commodity has been affected in some degree by speculative operations. Next to this article Cotton-Seed products have ruled strongest under the support of a good, legitimate demand for both home and export account. The position generally is favorable for a continued firm market for the more staple lines of Oils.

Linseed Oil.—City brands remain very firm at 60¢ for domestic Seed and 62¢ for Calcutta Seed Raw Oil, with the usual 3¢ advance for Boiled. Out-of-town brands have been picked up at 58¢ in limited quantities, but little, if any, can be had at less than 59¢ at the present time. The demand has been better the past week than at any previous time since the early part of last month.

Cotton-Seed Oils.—Crude has been selling with some freedom, chiefly in lots of 100 to 200 barrels, and prices have advanced 1½¢ ℔ gallon, several transactions at 28½¢ being recorded. Within the past few days that price has been shaded ½¢, but the market retains a firm undertone. Summer Yellow has done better by 1¢ ℔ gallon on price, and met with fairly liberal sale, exporters alone having taken some 2500 barrels, on the spot and to arrive.

Lard Oil.—There has been no change whatever on this article. The crude material continues low and the demand for the Oil somewhat irregular, but city pressers hold firmly at 53¢ for prime stock and 52¢ appears to be the lowest price on out-of-town brands.

Olive Oil.—Importers, evidently weary of waiting to bring prices here up to a parity with those current in the foreign market, have taken matters in hand, and through purchasing weak lots have run prices up 5¢ or more. Italian Yellow Oil in barrels is quoted now at 80¢ upward, with 85¢ generally asked. Outside of the speculative movement there has been very little business.

Sperm and Whale Oils.—There has been no movement of crude Oils in the New Bedford market and former prices are quoted in the absence of transactions. The manufactured products have been selling very fairly in a jobbing way and are firm at the previous range of prices.

Menhaden Oil.—A few hundred barrels of dark crude at 21½¢ and of prime at 23¢ have been purchased for export. The home trade demand has been moderate. Stocks are fairly liberal, the report of the association showing a total of about 7000 barrels in first hands. Pressed and Bleached Menhaden and Tanners' Oils are without change.

Cocoanut Oils.—Ceylon is very firm at 5½¢ @ 5¾¢, according to style of package and size of lot, but rather slow of sale. Reports from the primary market are very strong. There is no change on Cochin or American.

Artistic Ironwork.

As the trade are aware, the Yale & Towne Mfg. Company, Stamford, Conn., and 84 Chambers street, New York, have of late been giving much attention to the production and introduction of artistic ironwork. Most of their attractive styles are not represented in printed form, but are photographed for the use of architects and the trade who are interested specially in such goods. A few of their designs are represented in the accompanying illustrations, which are given as indicating in a general way the character of the work they are doing and calling attention to a line of goods which will doubtless be of increasing interest to the trade. The attention given by this company and other manufacturers to the production of artistic goods, meeting the demand for a finer grade of work than has heretofore been within the reach of the trade, is a matter of congratulation.

We herewith present engravings of hinge plates, escutcheon plate and grille work of new and beautiful design recently placed on the market by the Yale & Towne Mfg. Company. Fig. 1 shows a light iron grille of elaborate workmanship. All the leaves and the flowers in the center are hammered out to a very delicate thinness, producing an effect of lightness and grace which in the original is very pleasing. This particular grille is a reproduction from an old German design and goes to show that the skill of the blacksmith has not altogether departed. Fig. 2 shows a design for wrought-iron hinge plates, both corner and middle, also of corner plates, escutcheon plates and bell push plate. These designs are intended to be so made as to be applicable to many doors, and while the design is thought to be effective, the plates can be produced at a very moderate price. Fig. 3 shows a store-door handle and escutcheon plate combined, and is made in cast iron, Bower-Barff finish. While the effect is very rich, the price is moderate.

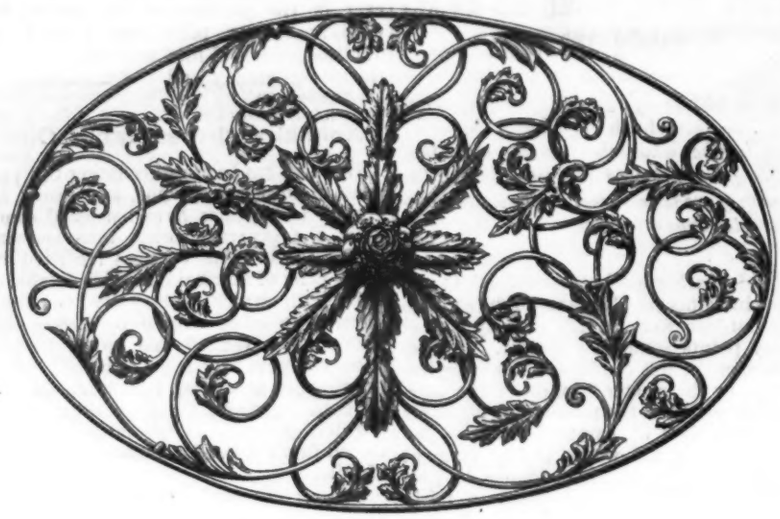


Fig. 1.—Wrought-Iron Grille.

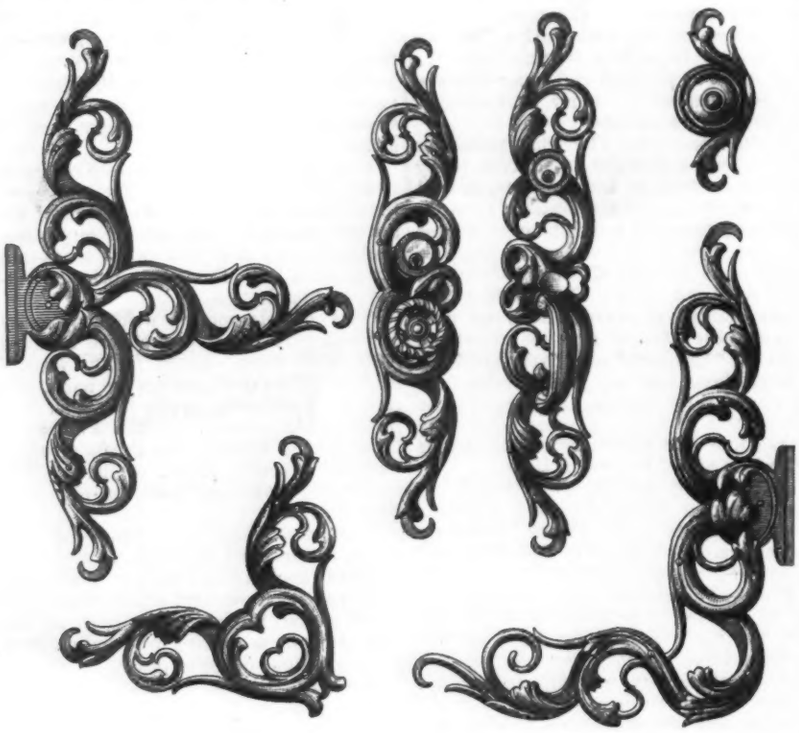


Fig. 2.—Wrought-Iron Hinge-Plates.

Trade in Canada is slow and prospects for the winter are uncertain. In respect of manufacturing an unprofitable winter seems inevitable. The absence of snow has been a serious drawback in the lumbering industry, and has interfered with the marketing of produce. Remarking upon the unusual number of failures during the past year, a Montreal editor says: It is necessary to point out that the depression, or hard times, has not been experienced in all the provinces. Nova Scotia, for example, has had a splendid year. New Brunswick and Prince Edward Island have also experienced a favorable year, the failures being unimportant in point of liabilities; in fact the maritime provinces are clearly enjoying more trade prosperity than any other portion of the Dominion. Ship-building and freights, in which these provinces by the sea are so largely interested, took on a marked revival during the year, and yielded larger profits than for a decade past; the fishing industry has been profitable so far as prices are concerned; the harvest was an abundant one; coal and gold mining in Nova Scotia attained larger proportions than ever before; and the lumber trade, in which New Brunswick is largely interested, was active and profitable throughout the year. It is in the central provinces, Ontario and Quebec, that business appears to have encountered difficulties.

Fig. 3.—Stone Door-Handle, Cast-Iron.

Foreign vessels are getting all the profits to be made in the ocean-carrying trade. Captain Snow, president of the Marine Society, says there are now only 50 American-built sailing-vessels in this country fit for long voyages; only 50! Not one steamer carrying the American flag is engaged in the trade with Europe, and but for Ward's Line and the Pacific Mail this country would be unrepresented in the Caribbean Sea and the Pacific Ocean. The American Shipping Convention will assemble in Washington next month and again ask Congress to revive the merchant marine by a system of bounties, subsidies or liberal payments of mail service.

Chicago Double Grinder Coffee-Mill.

The Chicago Coffee-Mill Company, 196 Oak street, Chicago, are putting a new coffee-mill on the market which is constructed on a system patented October 19, 1886. The illustrations herewith given present a view of the coffee-mill and its constituent parts. These mills are made with both exposed and sunken hoppers.

Fig. 1.—Chicago Double-Grinder Coffee-Mill, Sunken Hopper.

Fig. 2.—Grinding Mechanism in Nos. 20, 30 and 40.

They are so constructed that the grinders center perfectly, the lower shell having center rivet bearings. A self-adjusting spiral spring enables the operator to adjust and grind coffee or spices to powder with perfect ease. The drawer is of a new pattern, made of heavy tin, so as to be perfect in fit and thoroughly durable. The shape of the drawer enables its contents to be easily discharged into a coffee-pot. The percolation principle in making coffee has now become so general that a demand exists for mills which will grind coffee very fine, and the construction of the Chicago mill has been designed with that end in view, as well as to secure speed in operating. The manufacturers claim several distinct points covered by their mills, as follows: 1. Hard wood only is used in the boxes, so as to secure a good smooth finish, which is necessary in getting up coffee-mills to make a neat appearance. 2. The grinders are held in a perfectly true position, so that they do not get out of center, causing iron to grind against iron. 3. The castings are made very strong, the grinders being chilled to make them unusually hard. 4. Five sizes are made and they are sold at very moderate prices. The hoppers and covers are neatly finished in bronze, copper, maroon and japan. Single grinders are also made by the company, and are furnished with the adjuster and the patent drawer.

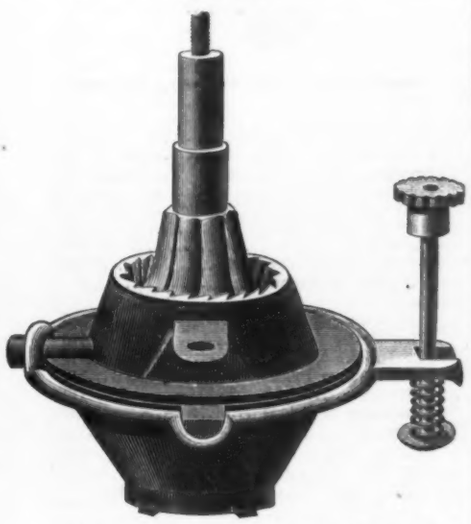


Fig. 3.—Grinding Mechanism in Nos. 50, 60 and 70.

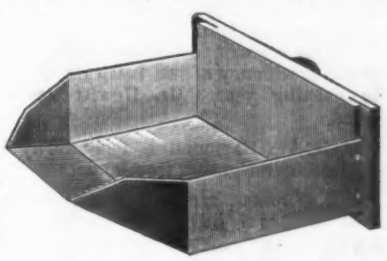


Fig. 4.—Drawer for Coffee Mill.

The United States is Mexico's best customer, taking the larger part of her exports, as shown by the Treasury report for the fiscal year ended June 30 last. The total receipts were $60,158,423, against $48,885,908 in the previous fiscal period, a gain of $11,272,514, which is the result of the increased prosperity of the country. The exportation of precious metals, mostly silver, was $38,785,274, and of merchandise, $21,373,148. The totals by countries were: United States, $40,853,362; England, $12,535,534; France, $3,496,038; Germany, $2,061,563; Spain, $659,000. The remainder is credited in small amounts to various countries, but facts show that the United States takes 68 per cent., England a trifle under 21 per cent., France only a little less than 6 per cent. and Germany 3 per cent. of Mexico's exports. The Latin nations of Europe and America took less than 8 per cent. In the previous fiscal year the United States took Mexican products to the extent of $31,059,626. Imports by way of Laredo and El Paso during the single month of November were valued at $1,000,000.

Cronk's Steel-Covered Anti-Friction Barn-Door Hanger.

The Cronk Hanger Company, Elmira, N. Y., are putting on the market the hanger represented in the accompanying engraving. The special feature of novelty in this hanger is indicated in its name, and the point is made that by the use of this steel cover no ice or snow can reach the wheels, while it also stiffens the hanger, the strength of which is referred to. A patent on the hanger has been recently obtained.

Cronk's Steel-Covered Anti-Friction Barn-Door Hanger.

Hanley's Ash-Sifter.

In the accompanying illustration we present a general view of an ash-sifter which is being manufactured under United States patents by the Hanley Mfg. Company, 307 Hennepin avenue, Minneapolis, Minn. This sifter is very substantially made of galvanized iron, and is so simple in its arrangement that the manufacturers claim it will not get out of order. From an inspection of the engraving it will be seen that the sifter consists of a cylindrical receiver placed in a nearly horizontal position upon a receptacle for the ashes. The unscreened ashes are placed in the receiver and are sifted by simply turning the handle shown at the right of the receiver. The manufacturers call attention to the fact that every part of the operation is carried on within a dust-proof inclosure, and that its use results in a saving of every particle of unburned coal, while preventing dust and dirt escaping into the apartment in which the sifter is used. It is said to be compact, light and almost noiseless. It can be carried with one hand, and is said to occupy no more floor-space than an ordinary coal-scuttle. The sifter is made in three sizes.

Hanley's Ash-Sifter.

A very good thing awaits the person who discovers a flux or solder for aluminum. Pure, clean zinc, or an alloy of zinc, tin and aluminum with Venetian turpentine as a flux will, with careful use of the blow-pipe to prevent melting the

aluminum, make quite a strong joint. But the trouble with these solders and all other solders used for aluminum is, that they won't "run" or "flow" as solder flows on brass or German silver. This "flowing" is necessary in all soldering work where it is not convenient to use a soldering-iron. To find a good "flowing" solder for aluminum lies more in the flux probably, than the solder itself. The point, therefore, to be gained, is the discovery of a flux which will facilitate the flowing of an aluminum solder, between thin seams of that metal, the same as in other metals.

Southern Pig-Iron Freights.

The Louisville and Nashville Railroad has issued a new rate sheet which went into effect on the 4th inst.:

To	From So. Pittsburgh, Tenn.	Chattanooga, Tenn.	Birmingham, N.; Birmingham, Woodward, Oxmoor, Ensley, Thomas, Bessemer, Decatur, Trussville and Gadsden, Ala.	Sheffield and Florence, Ala.	Nashville, Tenn.
Albion, Mich.	457	475	500	475	360
Ann Arbor, Mich.	456	470	495	470	370
Bridgeport, Ohio.	448	460	510	485	340
Chicago, Ill	426	445	470	445	300
Cincinnati, Ohio.	281	295	345	320	220
Cleveland, Ohio.	408	420	470	445	300
Columbus, Ohio.	358	370	420	395	250
East St. Louis, Ill.	354	370	395	350	250
Indianapolis, Ind.	354	370	395	370	225
Louisville, Ky.	275	295	320	295	150
Omaha, Neb.	605	619	619	574	533
Pittsburgh, Pa.	448	460	510	485	340
Springfield, Ill.	426	445	470	445	345
Toronto, Can.	581	595	645	620	520
Wheeling, W. Va.	448	460	510	485	340

The Queen and Crescent route have issued their rate sheet which went into effect on the 11th inst.:

To	From Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Birmingham, Ala.	Florence and Sheffield, Ala.	Anniston, Ala. (via Attalla).
Altoona, Pa.	4.82	.....	5.17	. ...	5.17
Baltimore, Md.	4.38	.. ...	....	.....	.....
Birdsboro, Pa.	4.67	.....	5.02	.....	5.02
Conshohocken, Pa.	4.67	.....	5.02	.....	5.02
Danville, Pa	4.61	.....	4.96	.....	4.96
Harrisburg, Pa.	3.76	. . ..	4.11	... ..	4.11
Johnstown, Pa.	7.75	.....	5.10	.....	5.10
Lebanon, Pa.	4.46	.....	4.81	.....	4.81
New York, N. Y.	4.40	.....	.....	.....	.....
Philadelphia, Pa.	4.40	.....	.....	.....	.. ...
Providence, R. I.	4.65	.....	.....	.....	.....
Scranton, Pa.	5.17	.....	5.52	.....	5.52
Syracuse, N. Y.	5.55	5.75	6.13	.....	6.13
Utica, N. Y.	5.78	.....	6.13	.....	6.13
West Duluth, Wis.	6.10	6.30	6.30	6.05	6.80
Wilmington, Del.	.....	.....	.....	.....	.....

These rates are all in carload lots of 17½ tons of 2268 pounds each.

An establishment at Menasha, says the Fond du Lac (Wis.) *Journal*, is turning out a pulley of extraordinary dimensions for a factory at Norwich, Conn. It will have a 62½-foot face, which, with its diameter of only 4 feet, will give it the appearance of a tall smoke-stack lying in a horizontal position. Four thousand feet of lumber, a barrel of bolts and 3000 pounds of castings will be used in its manufacture, and when in position it will run 45 belts from it both ways. It will be the largest pulley in the world.

PERSONAL.

A number of important changes in the management of rolling mills in the Mahoning Valley, Ohio, went into effect on Monday the 13th inst. Ralph J. Wick, manager of the Hubbard Iron Works, has resigned, and will remove to Lancaster, Ohio, where he with other Youngstown capitalists is engaged in erecting a large rolling mill. William P. Connell, manager of the Trumbull Iron Company's mill, at Girard, will succeed Mr. Wick at Hubbard. Wilford F. Arms, of the Warren Rolling Mill, will fill the vacancy at Girard, and James A. Campbell, who has resigned as manager of the Youngstown Ice Company, will enter upon his duties as manager of the Warren Mill.

Edward Ilsley has been made secretary and treasurer of the Buena Vista Iron Company and the Graham Furnace Company, the two companies who are building new coke furnaces at Buena Vista and Graham, respectively, in Virginia. Mr. Ilsley's office is in the Bullitt Building, Philadelphia.

L. E. Cochran was elected president and treasurer of the Andrews Iron Company, operating furnaces and mills at Hazelton, Ohio.

F. B. Baird has resigned his position as general manager of the Tonawanda Iron and Steel Company, of Tonawanda, N. Y., to take charge of a furnace property at Syracuse which he has leased.

A number of members of the American Institute of Mining Engineers have signed an address to Hon. Abram S. Hewitt, asking his consent to become a candidate for the presidency of the institute during the ensuing year. Mr. Hewitt has accepted.

Dr. R. W. Raymond is temporarily in Virginia investigating iron lands.

F. D. Thomas, mechanical engineer, of New York, is reported to be the projector of a company to furnish the city of Elizabeth, N. J., with water from artesian wells.

A. R. Whitney, the iron manufacturer, of New York, is seriously ill with pneumonia.

William F. Bonnell, manager of the mills of the Trumbull Iron Company, at Girard, Ohio, has resigned this position to accept the appointment of secretary and treasurer of the Hubbard Iron Company, of Hubbard, Ohio.

Samuel Ames has recently associated himself with C. M. Morse, of Buffalo, and they are doing a general engineering and contracting business under the firm name of Buffalo Engineering Company. They will make a specialty of passenger and freight elevators.

The Chicago Shipbuilding Company, recently organized in Chicago by the controlling owners of the Globe Iron Works Company, of Cleveland, and prominent capitalists identified with the Illinois Steel Company for the purpose of building steel ships on the Calumet, has just closed a contract with the Minnesota Steamship Company for two boats to cost about $210,000 each. The Minnesota Steamship Company is virtually the Minnesota Iron Company, and with the close of this deal the Globe Company, of Cleveland, has six boats to build for the trade between Two Harbors and the Chicago mills, four of them having been contracted for in Cleveland a few months ago. The Chicago company will begin work as soon as the new yards on the Calumet at South Chicago can be put in shape. All of the boats will be duplicates—292 feet keel, 308 feet over all, 40 feet beam and 24½ feet hold.

Gerald Lomer, Jr., and John B. Rose have formed a copartnership, amalgamating their business under the name of Lomer & Rose, of Montreal and Toronto. John B. Rose will be in charge of the branch at the latter city. The firm does a business in iron and steel and as general agents.

The New York pilot service comprises 126 pilots and 19 boats There were 6213 vessels piloted inward and outward during 1889, for which $412,743 was collected in pilotage fees. There were five cases of vessels touching the bottom while in charge of pilots.

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CURRENT HARDWARE PRICES.

JANUARY 15, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ℔ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands, 20&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40@40&5%

Wads—

U.M.C.&W. R. A.—B. E., 11 up..$2.00
U.M.C.&W. R. A.—B. E., 9&10..2.30
U.M.C.&W. R. A.—B. E., 7&8...2.60
U.M.C.&W. R. A.—P. E., 11 up..3.10
U.M.C.&W. R. A.—P. E., 9&10..4.00
U.M.C.&W. R. A.—P. E., 7&8..4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80

(See Trade Report.)

Anvils.—

Eagle Anvils, ℔ 10¢.....15@15&5%
Peter Wright's.....10½¢
Armitage's Mouse Hole.....9¢
Armitage's Mouse Hole, Extra.11½@11¾¢
Trenton.....9¼@10¢
Wilkinson's.....9¾@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....℔ doz $4.75
Antrim Combination.....℔ doz 5.50
Baldwin.....℔ doz 5.25
Champion.....℔ doz 7.25
Daisy.....℔ doz 4.00
Eureka, 1888.....each 17.00
Family Bay State.....℔ doz 12.00
Favorite.....℔ doz 5.00
Gem.....℔ doz 5.25
Gold Medal.....℔ doz 4.00
Ideal.....℔ doz 4.00
Improved Bay State.....℔ doz 30.00
Little Star.....℔ doz 4.50
Monarch.....℔ doz 13.50
New Lightning.....℔ doz 5.50
Oriole.....℔ doz 4.00
Penn.....℔ doz 4.00
Perfection.....℔ doz 4.00
Pomona.....℔ doz 4.00
Rocking Table.....℔ doz 6 00
Turntable.....℔ doz 4.50
Victor.....℔ doz 13.50
Waverly.....℔ doz 4.00
White Mountain.....℔ doz 4.50
72.....℔ doz 4.25
76.....℔ doz 5.75
78.....℔ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co. } 70%
French, Swift & Co. (F. H. Beecher, Rockford Bit Company.
Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....50&10@60%
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&5&2 %
Worstner Pat. Auge Bits.....10%
Cincinnati Bell-Hangers' Bits.....30%

Hollow Augers—

Ives' } 33⅓ @
French, Swift & Co. } 33⅓&10%
Douglass'
Bonney's Adjustable, ℔ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....30@30&5%
Cincinnati Standard.....35&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ℔ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common .....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ℔ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood..40&10%
Cincinnati, for wood.....30&5%
Cincinnati, for metal..40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ℔ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ℔ doz.....40&10%
Pat. Sewing, Long.....℔ doz $1.20
Pat. Peg, Plain Top. ℔ gr $10.00...45&10%
Pat. Peg, Leather Top. ℔ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ℔ gr $1.70, 35%
Awls, Should. Peg. ℔ gr $2.45, 40@40&10%
Awls, Pat. Peg...℔ gr 63¢.....40@40&10%
Awls, Shouldered Brad..2.70 ℔ gr.....35%
Awls, Handled Brad...$7.50 ℔ gr.....45%
Awls, Handled Scratch ℔ gr, $7.50.35&10%
Awls, Socket Scratch. ℔ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00.....55&10%
Gray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12. 2, $18.....25%
Henry's Combination Haft...℔ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality .....℔ doz $6.00@$6.50
Others.....℔ doz $5.50@$5.75

Axle Grease—

Fraser's .....Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes.....℔ gr $9.50
Dixon's Everlasting, in bxs...℔ doz 1℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 85¢
Lower grades, special brands. ℔ gr $5.50@$7.00

Axles—

No. 1.4½@5¢, No. 2 5½@6¼ } 3 % cash
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....℔ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24-℔.....℔ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Bells—

Hand—

Light Brass.....70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10&35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10&50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow -

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70&70&10%
Texas Star.....50&10&50&10&5%
Call.....40@40&5%
Farm Bells.....℔ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths' .....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....℔ doz $9, 50%
Hotchkiss's.....℔ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's .....℔ doz $3.....10%
Cincinnati.....25&10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....℔ doz $3.00, 33⅓%
Excelsior.....℔ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ℔ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ℔ gr..60&10%
Van Sand's Old Pat., $15.00 ℔ gr..55&10%
Washburn's Old Pattern, ℔ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ℔ gr.....$9.00
Security Gravity, ℔ gr.....$9.00

Blind Staples—

Barbed, ¼ in. and larger.....℔ ℔ 7½@8¢
Barbed, ⅜ in.....℔ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)...65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's ..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....70&12½&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine.....
Bolt Ends.....

Tire—

Common, list Feb. 28, '88.....67½%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....67½%
Keystone, Philadel., list Oct. '84...80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....67½%
R.B.&W., Philadel., list Oct. 16, '84...80%

Stove and Plow—

Stove.....62½%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....℔ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	...40&10&10	
Jennings	5.50	6.75	...45@45&10	
Other Machines...	2.35	2.75		net
Phillips' Patent with Augers ...	.00	7.50		

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's...$17 and $18.....60&10%
Peck, Stow & W. Co..50&10&50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....60&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....85%

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
} Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....60%&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
.70&5@70&10%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
.70&5@70&10%
Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....℔ ℔ 5½@6¢
Dewicks (Burke).....℔ ℔ 5½@6¢

Can Openers—

Messenger's Comet.....℔ doz $3.00, 25%
American.....℔ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....℔ doz $3.75, 20%
No. 4 French.....℔ doz $2.25, 55@60%
No. 5, Iron Handle.....℔ gr $5.00, 45&50%
Eureka.....℔ doz $2.50, 10%
Sardine Scissors.....℔ doz $2.75@3.00
Star.....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ℔ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ℔ doz $3.00.....35&5%
Domestic, ℔ doz $2.50.....45%
Champion ℔ doz $2.00.....5[illegible]%

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $36.00

Cartridges—
See Ammunition.

Casters—
Bed..... } Brass....55@55&10%
Plate..... } Others...60@60&10%
Shallow Socket.....
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....60&5&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6¼-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6¼-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884.....50&10@50&10&5%
American Coil, in cask lots,
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
$8.00 5.70 4.80 4.20 3.90 3.75 3.65 3.55
Less than cask lots, add ¼¢@½¢ ₱ ℔.
German Coil, list of June 20, 1887.....50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5@5½¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....
Mix.....
Ohio Tool Co.....
.....75 @ 75&10 %
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $7
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5&10&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises.
Carpenters', Cincinnati.....1.5%

Clips—
Norway, Axle, ½ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....66⅔&5&20%
Norway Spring Bar Clips, 5-16..20&5&5%
Wrought-Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—
Bradley's.....10%
Wadsworth's.....35%

Cradles—
Grain.....50&5&2 @ 50&10&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4½¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50...55&10%
Hercules.....50%
Shaw Door Check and Spring.35@30@35%

Drawing Knives—
Witherby.....
P. S. & W.....
Mix.....
New Haven.....
.....75 @ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50.20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools... $1.75@$1.85
Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits

Drill Chucks.—See Chucks.

Dripping Pans—
Small sizes.....₱ ℔ 6½¢
Large sizes.....₱ ℔ 5½¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)....₱ doz $3.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery—

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₱ ℔	4½¢	5 ¢	2½¢
½ kegs, ₱ ℔	4¾¢	5½¢	2¾¢
¼ kegs, ₱ ℔	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10%
Cork Lined.....70&5&70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ ℔ 6@6½¢

Fifth Wheels.—
Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands....60&10&70%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.00 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10@30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10 @ 75%
Acme Fry Pans.....60&10%

Fuse— ₱ 1000 ft
Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50&50&5%
Wire, Brown & Sharpe's.....10@20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process.....25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85..25&10@35%
Buffalo Hammer Co. } List Jan. 15, '87
Humason & Beckley } 50@50&10%
Atha Tool Co. }
Fayette R. Plumb.....40&10@50%
C. Hammond & Son..List, Oct., 1889, 50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢ }
3 to 5 ℔.....₱ ℔ 36¢ } 70@70&10%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢ ₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25

Handles—
Iron, Wrought or Cast—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	.50

60&10&10%
Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd.₱ gr 4.50 } 25%
Hickory Firmer Chisel, large. ₱ gr 5.00 } off
Apple Firmer Chisel, ass'd...₱ gr 5.00 } list
Apple Firmer Chisel, large...₱ gr 6.00 } list
Socket Firmer Chisel, ass'd..₱ gr 3.00 } list
Socket Framing Chisel, ass'd. ₱ gr 5.00 } list
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr ? 75 } 40&
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake Shovel, c.....50&100

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion.....15¢

Hangers—
Barn Door, old patterns...60&10&10@70%
Barn Door, New England..60&10&10@70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10&60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in, $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00.....50&15&60%
Wood Track Iron Clad, ₱ ft, 10¢.....50&15&60%
Carrier Steel Anti-Friction.....50&50&5%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30&30&10%
Lane's Steel Anti-Friction.....50%
Ball Bearing Door Hanger..20&10&25&10%
Warner's Pat.....20&20&10%
Stearns' Anti-Friction.....20&20&10%
Stearns' Challenge.....25&10&25&10&10%
Faultless.....40&40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60&60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap..33⅓%
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction.....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10&40&10&5%
May.....50&5&50&10%
Barry, $6.00.....40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood.....35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad.....40%
Buffalo Hammer Co.....40&10&50%
Hurd's.....40&10&50%
Fayette R. Plumb.....40&10&50%
Wm. Mann, Jr., & Co.....50@50&5%
Underhill Edge Tool Co.....40&5&40&10%
Underhill's, Haines and Bright.....33⅓%
C. Hammond & Son.....40&10&50%
Simmons'.....40&10&50%
Peck's.....40&10@40&10&5%
Kelly's.....50@50&5%
Sargent & Co.....50%
Ten Eyck Edge Tool Co.40&10@40&10&5%
Collins.....10%
Schulte, Loboff & Co.....50@50&5%

Hay and Straw Knives—
Lightning...Mfrs', price ₱ doz $18.00, 25%
But jobbers cut this price freely.
Gem.....₱ doz $10
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₱ doz $11.50@$12.00
Heath's.....₱ doz $13.50@14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T.....70&10@75%
Screw Hook and Strap: 6 to 12 in., ₱ ℔ .4 2-10¢; 14 to 20 in., ₱ ℔ .3 7-10¢; 22 to 36 in., ₱ ℔ .3 2-10¢
Heavy Welded Hook: 6 to 12 in., ₱ ℔ .4 2-10¢; 14 to 20 in., ₱ ℔ .3 7-10¢; 22 to 36 in.,₱ ℔ .3 2-10¢
Screw Hook and Eye: ⅛ in., ₱ doz $1.50; ⅝ in., ₱ doz $2.45; ¾ in., ₱ doz $3.80; 10%
Rolled Blind Hinges, Nos. 32 and 34.....50&10%
Rolled Blind Hinges, Nos. 232 and 234.....55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges (8, 10 & 12 in., ₱ ℔.....5¢ "Providence" over 12 in., ₱ ℔.....4¢
Spring Hinges—
Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Acme.....30%
C. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Gate Hinges—
Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%
Blind Hinges—
Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Wynter.....50%
Clark's, Nos. 1, 3, 5, 40 and 50.....75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13.....75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10&5%
Niagara.....80&2½%
Buffalo.....80&5%
Clark's Genuine Pat.....80&5%
O. S., Lull & Porter.....75&10@80%
Acme, Lull & Porter.....75&5%
Queen City Reversible.....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50.....25&2%

Hoes—
Handled—
Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00
Eye—
D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. 60&5@60&10%
Hubbard & Co., S. & O. Pat.60&5@60&10%
Chattanooga Tool Co., S. & O. Pat..60&5@60&10%
Grub.....60&60&10%

Hog Rings and Ringers—
Hill's Improved Ringers.....₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs.....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.00@1.70
Perfect Ringers.....₱ doz $2.15@$2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 90¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block.....40%
Energy Mfg. Co's.....25%

Holders, File and Tool—
Bals Pat.....₱ doz $4.00; 25%
Nicholson File Holders.....20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground.....55&5@60&5%
Unground.....65&10@65&10&5%
White Enameled-Ware—
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Agate and Granite Ware, list Jan. 1, 1880.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Rustless Hollow-Ware.....50@50&5%
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton..... 40&5%
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co..... 40&5&5%
William Rogers Mfg. Co.....

Hooks—
Cast Iron—
Bird Cage, Sargent's list..... 60&10&10%
Bird Cage, Reading.....
Clothes Line, Sargent's list...
Clothes Line, Reading list.....
60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list.....55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%
Wrought Iron—
Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks).....30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c.
See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Belt.....80&80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron.....70&70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—

	Nos. 6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.....10% @ 11¢, net
Essex....28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Lyra.....25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Snowden....25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢.
1000 ℔ in year 10%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢.
25@25&5%
Globe.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33⅓&5%
Champlain..28¢ 6¢ 25¢ 24¢ 23¢.
25&10&10%
New Haven..28 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion...25¢ 23¢ 22¢ 21¢ 20¢.
10&10&10%
Capewell.....28¢ 26¢ 5¢ 24¢ 23¢.
35&5@35&10%
Star.....23¢ 21¢ 19¢ 18¢.
10&10@10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed.....14 ₱ ℔.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition.....75&10@75&10&5%
Standard.....70@70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....30&10%
N. Y. B. & P. Co., Extra.....50%
N. Y. B. & P. Co., Dundee.....60&10&5%

Huskers—
Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper.....₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3.....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls, 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set.....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$3.00
See also *Pails.*

Jack Screws—See Screws.

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ℔....	24¢	21 ¢
Brass larger than 17 in., ₱ ℔.....	26¢	23½¢

Enameled and Tea Kettles.
See *Hollow-Ware.*

Keys—
Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%

Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.,.....$2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Knobs—
Door Mineral.....65@68%
Door Por. Jap'd.....75@78%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%

Ladies'—
Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₱ doz $4.00, 40%
Melting, P. S. & W.....35&10&40%
Melting, Warner's.....30%

Lanterns—
Tubular—
Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards.....$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—
Standard List.....50&10%
Quaker City.....60&10%
Enterprise.....60&10%

Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved.....₱ doz $3.75, 20%
Sammis...No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's...Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₱ doz $12.00

Lines—
Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.25; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes.. Nos. 18 19 20
$4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar. 20, 1889..... 60&10@60 &10&10%
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co., list Aug. 1, '88.....
Reading Hardware Co., list Feb. 2, '88.....
Much lower net prices often made.
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
Deitz L. & C. Round Key Latches.....30&10%
Deitz L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Feiter or American.....40&10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Par- ker and Corbin... } List March, '84, rev Jan. 1, '85..33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30@33⅓&5%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓&5%
Yale.....net prices
Romer's.....25%
Padlocks—
List Dec. 23, '84.....75@75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 21.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9, 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 110, 120, 130 and 140.....90&10%
Other Nos.....60%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%

Lumber Tools.
Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies.....₱ doz $19.00
Cant Hooks, "Blue Line"...₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00

Lustre—
Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Mallets—
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting...₱ doz $1.50

Mattocks. Regular list.....60&5%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—
Dixon's ₱ doz.....40&5%

Nos.....	1	2	3	
	$14.00	$17.00		30.00

Woodruff's ₱ doz.....40&5%

Nos...		100	150
		$15.00	$18.00

Champion ₱ doz.....40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz.....70@70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.....	1	2	3	4	B	5
Each.....	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos.....	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania.....40&10%

Nos.....	1	2	3	00
₱ doz....	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz.....45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos..5	2	6	8	
$50	$75	$90	$225	.....20@25%

Beef Shavers (Enterprise).....20&10@30%
Chadborn's Smoked Beef Cutter. ₱ doz $66.00

Mincing Knives—
Am. (2d quality), ₱ gr., 1 blade blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₱ doz $3.00, 25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Molasses Gates—
Stebbin's Pattern..... 75@75&10%
Stebbin's Genuine..... 60&10&10%
Stebbin's Tinned Ends..... 40&10%
Chase's Hard Metal..... 50&10%
Bush's..... 30%
Lincoln's Pattern..... 70@70&10
Weed's..... 20&10%

Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10..... 60&10&10%

Money Drawers....₱ doz, $18@$20

Muzzles—
Safety..... ₱ doz, $3.00, 25 %

Nails, see Trade Report.

Wire Nails, Papered.
Association list, July 15, 1889,...70&5%
Tack Mfrs.' list..... 60&10&10%
Wire Nails, Standard Penny,
Card June 1, '89, base.....$3.00 @ $3.10

Nail Puller—
Curtiss Hammer..... ₱ doz $9.00
Giant, No. 1..... ₱ doz. $18.00, 10%
Giant, No. 2..... ₱ doz, $15.00, 10%
Pelican..... ₱ doz, $9.00, 25%

Nail Sets—
Square..... ₱ gr., $4.00@$4.25
Round..... ₱ gr. $3.25
Cannon's Diamond Point...₱ gr.,$12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.)..... 40%
Blake's Pattern..... ₱ doz $2.00, 10%
Turner & Seymour Mfg. Co... ..... 50%

Nuts—
nuts ,off list Jan. 1, 1888: Square. Hex.
Hot Pressed..... 5.1¢ 5.8¢
Cold Punched..... 5.1¢ 5.4¢
In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—
Government..... ₱ ℔ 7½@7¾¢
U. S. Navy..... ₱ ℔ 6¾@6¾¢
Navy..... ₱ ℔ 5½@5¾¢

Oilers—
Zinc and Tin..... 65@65&10%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.00; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list..... 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc..... 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc..... 60%
Broughton's Brass 50%
Gem P. D. & Co..... ₱ gro. $2

Packing, Steam—
Rubber—
Standard ..... 60&10@60&10&10%
Extra ..... 50&10@60%
N. Y. B. & P. Co., Standard ...50&10&5%
N. Y. B. & P. Co., Empire 70%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 30%
Jenkins' Standard..... ₱ ℔ 80¢, 35%

Miscellaneous—
American Packing..... 10¢@11¢ ₱ ℔
Russia Packing ..... 14¢ ₱ ℔
Italian Packing ..... 13¢@14¢ ₱ ℔
Cotton Packing ..... 15¢@17¢ ₱ ℔
Jute..... 7¢@8¢ ₱ ℔

Padlocks—
See Locks.

Pails—
Galvanized Iron—See Trade Report
Quarts 10 12 14
Hill's Light Weight, ₱ doz. $2.75 3.00 3.25
Hill's Heavy Weight, ₱ dz. 3.00 3.25 3.75
Whiting's..... 2.75 3.00 3.25
Sidney Shephard & Co.... 2.94 3.15 3.57
Iron Clad 2.50 2.75 3.00
Fire Buckets..... 2.75 3.25 3.50
Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt ..... ₱ doz $6.00
Fire, Stable and Milk, 14 qt ..₱ doz $7.80
Standard Fibre Ware—
Plain. Decr'd
Water Pails, 12 qt., per doz..$4.00 $4.50
Dairy Pails, 14 qt., per doz. 4.50 5.00
Fire Pails,No.1,12 qt.per doz 4.50
Fire Pails,No.2,14 qt.per doz 5.00
Sugar Pails..... 6.00 6.50
Horse Pails..... 5.00
Buggy Pails..... 4.00
Slop Jars (bal. trap)..... 8.00 9.00
Chamber Pails, 14-qt..... 6.50 7.50

Pencils—
Faber's Carpenters'..... ..high list 50%
Faber's Round Gilt..... ₱ gro $5.25
Dixon's Lead..... ₱ gro $4.50
Dixon's Lumber..... ₱ gro $6.75
Dixon's Carpenters' ....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00..... 60 @ 60&5%

Picture Nails—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent..... 40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 50%
1¼ and under, Galvanized 42½%
1½ and over, Plain..... 62½%
1½ and over, Galvanized 50%
Boiler Tubes, Iron.
1½ and under..... 50%
2 in. and larger..... 55%

Planes and Plane Irons—
Wood Planes—
Molding..... .....50&10%
Bench, First Quality.. .....55&10%
Bench, Second Quality ..... 60&10%
Bailey's (Stanley R. & L. Co.)..... 40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.)..... 40@10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10%
Victor Planes (Stanley R. & L. Co.).20&10%
Steer's Iron Planes..... .....35@35&5%
Meriden Mal.Iron Co.'s..30&10@30&10&10%
Davis's Iron Planes ...30&10@30&10&10%
Birmingham Plane Co..... .50@50&5%
Gage Tool Co.'s Self-Setting..... 20&10%
Chaplin's Iron Planes ..... 40@40&5%
Sargent's ..... 30&10@30&10&10%
Plane Irons—
Plane Irons ....20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros 30%
Plane Irons, Auburn Tool Co., "Thistle" 55%
Sandusky Tool Co.:
Single and Cut..... .30%
Double 40%
L. & I. J. White..... 25%

Pliers and Nippers—
Button's Patent..... .30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz ....20&10@33⅓%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers..... 60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel..... .....25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, ₱ add 6& dis 10%
Carew's Pat. Wire Cutters..... .....20%
Morrill's Parallel, ₱ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List ..... .70&10@70&10&10%
Disston's..... .....45&10%
Pocket Levels..... .70&10@70&10&10%
Davis Iron Levels..... .....30%
Davis' Inclinometers ....10&10%

Polish, Metal.
Prestoline..... .....20&10%
Prestoline Paste 33⅓%
Gaston's Silver Compound..... .....33⅓%

Pokes, Animal—
Bishop's I. X. L..... ₱ doz $6.00
Bishop's O. K. ..... ₱ doz $5.25
Bishop's Pioneer..... ₱ doz $3.75
Bishop's American..... ..... ₱ doz $2.75

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1¼ qt ..₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₱ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers ..... ₱ doz $16.00@17.00
Leed's..... ₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant ..... ₱ doz $18.00
Kohler's Hercules ..... ₱ doz $15.00
Kohler's New Champion..... ₱ doz $0.00
Schneidler..... ₱ doz $18.00
Ryan's Post Hole Diggers... ₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger,₱ doz $30.00, 50%
Imperial, ₱ doz, $15..... 45%

Potato Parers—
White Mountain ..... ₱ doz $5.00@5.50
Antrim Combination..... ₱ doz $8.00
Hoosier..... ₱ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw..... ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools..... 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@ 4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25 : No. 2, 7.25

Pulleys—
Hot House, Awning, &c..... .60&10%
Japanned Screw..... ..... 60&10%
Brass Screw..... .60&10%
Japanned Sicks..... .60%&10%
Japanned Clothes Line..... .60&10%
Empire Sash Pulley..... .55@60%
Moore's Sash, Anti-Friction..... 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50..... 50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "F" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron..... 30%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack 45%
Tackle Blocks..... ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00. ....40%

Pumps—
Cistern, Best Makers ..... .60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis&Call Co's Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat..... 15%
Bemis & Call Co.'s Spring and Check ..40%
Solid Tinners' ..... ₱ doz $1.44, 50%
Tinners' Hollow Punches..... .20&2%
Rice Hand Punches..... 15%
Avery's Revolving..... 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass..₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron ..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ½ ⅝ ¾
Per 100 feet..... $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet....$2.15 2.70 3.25..net
Terry's Steel Rail, ₱ foot..... 4½¢
Victor Track Rail, 7¢ ₱ foot..... .50&2%
Carrier Steel Rail, ₱ foot ..... 4½¢
Moore's Wrought Iron..... .25%

Rakes—
Cast Steel, Association goods ..... .70%
Cast Steel, outside goods..... .60&10@70%
Malleable ..... 70@70&5%
Gibbs Lawn Rake..... .$12.00, 50&15%
Canton Lawn Rake..... $9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00..... .....25%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AAA1, list Nov. 1, 1889..... .50%
Jordan's Old Faithful, list Nov. 1, '89..50%
Electric..... .....List net

Razor Strops—
Genuine Emerson..... .60@60&5%
Imitation " ....₱ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com..... ₱ doz $2.00
Lamont Combination..... ₱ doz $4.00
Jordan's Pat Padded, list Nov. 1,'89..50%
Electric. ....List net

Rivets and Burrs—
Iron, list Nov. 17, '87..... .....40%
Copper..... .60@50&10%

Rivet Sets..... .....50&10%

Rods—
Stair, Brass ....25&2%
Stair, Black Walnut .. .. ₱ doz 40¢

Rollers—
Barn Door, Sargent's list .....60&10&10%
Acme Moore's Anti-Friction..... .55%
Union Barn Door Roller 70%

Rope—
Manufacturers' prices:
Manilla...¼ in. and larger ₱ ℔ 14¼¢
Manilla ..... ⅜ in. ₱ ℔ 14¼¢
Manilla..... ½ and 5-16 in. ₱ ℔ 15 ¢
Manila Tarred Rope..... ₱ ℔ 13¾¢
Manila, Hay Rope..... ₱ ℔ 14¼¢
Sisal...½ inch and larger ₱ ℔ 11 ¢
Sisal..... ⅜ in. ₱ ℔ 11¼¢
Sisal..... ¼ and 5-16 in. ₱ ℔ 11¾¢
Sisal, Hay Rope..... ₱ ℔ 11 ¢
Sisal, Tarred Rope..... ₱ ℔ 10¼¢
Sisal, Medium Lathe Yarn. ₱ ℔ 10 ¢
Cotton Rope ..... ₱ ℔ 15@18¢ net
Jute Rope..... ₱ ℔ 7¼¢
(1½% for cash in 10 days.)

Rules—
Boxwood.....80&10&10@80&10&10&5%
Ivory..... .50@50&10%
Starrett's Rules and Straight Edges, Steel..... .25&10%

Sad Irons—
From 4 to 10, at factory ...₱ 100 ℔, $2.60@$2.75
Self-Heating..... ₱ doz $9.00 net
Self-Heating, Tailors'....₱ doz $18.00 net
Gleason's Shield and Toilet. ..... .25%
Mrs. Pott's Irons..... .....40@40&10%
Enterprise Star Irons 40%
Combined Fluter and Sad Iron, ₱ doz, $15.00 ....15%
Fox Reversible Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 85¢, 15%
New England..... .5¢, 15%
Mahony's Troy Pol. Irons..... .25%
Sensible..... .20@20&5%
National Self-Heating..... ..A..30 %

Sand and Emery Paper and Cloth—
List April 19, 1886..... .50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Sash Cord—
Common..... ₱ ℔, 10@11¢
Patent, good quality ..... ₱ ℔ 13@13½¢
White Cotton Braided, fair..₱ ℔ 20@20¢
Common Russia Sash..... ₱ ℔ 13½¢
Patent " " ..... ₱ ℔ 15¢
Cable Laid Italian Sash..... ₱ ℔ 22¢@23¢
India Cable Laid " ..... ₱ ℔ 13¢
Silver Lake—
A Quality, White, 50¢..... .10&10&5%
A Quality, Drab, 55¢..... .10&10&5%
B Quality, White, 50¢..... .20&10&5%
B Quality, Drab, 55¢..... .20&10&5%
C Quality, White (only)..... 26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White..... .30¢
Egyptian, India Hemp, Braided..... .25¢
Samson—
Braided, White Cotton, 50¢..30&30&5%
Braided, Drab Cotton, 55¢.....30&30&5%
Braided, Italian Hemp, 55¢..30&30&5%
Braided, Linen, 80¢..... .30&30&5%

Sash Locks—
Clark's, No. 1, $10 ; No. 2, $8 ₱ gr.. .33⅓%
Ferguson's 33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor..... .60&10&2%
Walker's..... .....10%
Attwell Mfg. Co..... .....25&33⅓%
Reading..... .60%&10@60%&10&10%
Hammond's Window Springs..... .40%
Common Sense, Jap'd, Cop'd and Br'zed..... ₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.. ....30%
Kempshall's Gravity..... .....60%
Kempshall's Model ....60&60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect..... .60@60&10%
Hugunin's Sash Balances ..... .25&5&2%
Hugunin's New Sash Locks..... .25&5&2%
Stoddard "Practical" 10%
Ives' Patent..... .60@60&10%
Liesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00. ....20&10%
Davis, Bronze, Barnes Mfg. Co..... .50%
Champion Safety, list March 1, 1888 55@55&5%
Security..... .....70%
Buckeye..... ₱ gro $4.80

Sash Weights—
Solid Eyes..... ₱ ton $22.00

Sausage Stuffers or Fillers—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry ....₱ doz, No. 1, $15.00: No. 0, $21.00..... .....50&5@50&10%
Draw Cut No. 4, each $30.00..... .....20%
Enterprise Mfg. Co..... .....20&10@30%
Silver's..... .....40&10%

Saws—
Disston's Circular.....45@45&5% | Extras sometimes given by jobbers.
Disston's Cross Cuts.....45@45&5%
Disston's Hand 25@25&5%
Atkins' Circular Shingle an Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts..... .....₱ foot 24@25¢
Atkins' Hollow Back X Cuts. .₱ foot 18¢
Atkins' Mulay, Mill and Drag.....40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand..... .30&5@30&10%
W. M. & C., Champion X Cuts, Regular..... .....₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back..... ₱ foot 27¢@29¢
Peace Circular and Mill..... ....45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—
Griffin's, complete. ....40&10@50%
Griffin's Hack Saw, Blades.....40&10@50%
Star Hack Saws and Blades..... .....25%
Diamond Hack Saws and Blades..... .25%
Eureka and Crescent..... .....25%

Saw Frames—
White Vermont..... ₱ gro $9.00@10.00
Red, Polished and Varnished..... ₱ doz $1.50, 25%

Saw Sets—
Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita.....₱ doz $3.25@5.25, 40&5@40&10%
Common Lever..... ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's....No. 0, $8.00; No. 1, $15, 15@20%
Nash's..... .20&10@20&10&10%
Hammer, Hotchkiss..... .....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer..... .....30&5%
Bemis & Call Co.'s Plate..... .....10%
Bemis & Call Co.'s Cross Cut..... .12½%
Aiken's Genuine..... .$13.00, 50&10%
Aiken's Imitation. ....$7.00, 55&5%
Hart's Pat. Lever..... .....20%
Disston's Star, $9, No. 15, $5.50; 20& 10@20&10@10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.60
Atkin's Criterion..... ₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00. ....40&10%
Avery's Saw Set and Punch..... .....50%
Am. Tool Co.'s Superior.....₱ doz $15,50%

Saw Tools—
Atkins' Perfection..... ₱ doz $15.00
Atkins' Excelsior..... ₱ doz $6.00
Atkins' Giant ..... ₱ doz $4.00

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain..... .$2.10@2.20
Union Platform, Striped..... .$2.20@2.30
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka. 25%
Chatillon's Favorite..... .....40%
Family, Turnbulls..... .30@30&10%
Richie bros.' Platform..... ..... 40%

Scale Beams—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1..... .....40%
Chatillon's No. 2..... .....50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50..... .....30&10%
Box, 1 Handle..... ₱ doz $4.00, 10%
Box, 2 Handle..... ₱ doz $6.00, 10%
Defiance Box and Ship..... .....20&10%
Foot..... .....50&10@66%
Ship, Common .... ₱ doz $3.50 net
Ship, R. I. Tool Co..... .....10%

Screen Window and Do Frames—
Porter's Pat. Window and Door Fram 33⅓&10%
Warner's Screen Corner Irons.. .33⅓@ 33⅓&10%
Stearns' Frames and Corners.25@25&10%

Screw Drivers—
Douglas Mfg. Co..... .....20&10&10%
Disston's..... .....45&10%
Disston's Pat. Excelsior..... .45&10%
Buck Bros..... .....30%
Stanley R. & L. Co.'s Varnished Handles..... .65&10%
Black Handles..... ....60&10%
Sargent & Co.'s No. 1 Forged Blade..... .60&10&10%
Nos. 20, 30 and 60..... .66⅔&10&10%
Knapp & Cowles' No. 1..... .60&20@70%
No. 1 Extra..... .60@60&10%
Nos. 00 & 4..... .50&5@50&10&5%
Stearns'..... .....25&10&5%
Gay & Parsons..... .....35%
Champion..... .....25&10%
Clark's Pat..... .....30@33⅓%
Crawford's Adjustable..... .....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list..... .....25%
Kolb's Common Sense ₱ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw Driver Bits..... ₱ doz 50@75¢
Screw-Driver Bits, Parr's..... ₱ gro $6.25
Fray's Hol. Hdle. Sets.No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel..... .....50%
Cincinnati..... .....20&10%
Brace Screw-Drivers..... .....25&10%
Buck Bros.' Screw-Driver Bits... ..%

Screws—
Wood Screws—List March 1,
Flat Head Iron.....50%
Round Head Iron....40%
Flat Head Brass.....45%
Round Head Brass...35%
Flat Head Bronze...45%
Round Head Bronze 35%
Extra 5 @ 10 % often given.

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point, according to size.....75&10@80%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....66⅔&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths..50&5&2@50&10&2%

Shears—
American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₩ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓&5
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%
Electric.....List net

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&10%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory.....$4.00
Mule—
Add $1 ₩ keg to above prices.
Ox, Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—
(Eastern prices 2¢ off, cash, 5 days.
Drop, ₩ bag, 25 ℔.....$1.19
Drop, ₩ bag, 5 ℔.....29
Buck and Chilled, ₩ 25-℔ bag.....1.44
Buck and Chilled, ₩ 5-℔ bag.....34

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5&7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).35%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.).30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Jan. 3, 1889...45&10%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters.....₩ doz $2.00; ₩ gr $21.60
Electric.....₩ gr $18.00
Hunter's.....₩ doz $2.00
Smith's Adjustable Sifters....₩ doz $2.00
Smith's Adjustable Milk Strainer.....₩ doz $2.00
Smith's Adjustable T. & C. Strainer.....₩ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₩ doz..	75¢	95¢
Mesh 20, Nested, ₩ doz..	90¢	$1.05
Mesh 24, Nested, ₩ doz..	$1.10	1.20

Slates—
School, by case.....50@50&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargen. sPatent Guarded....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E..... 60@10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spittoons, Cuspidors, &c.
Standard Fiberware—
Cuspidors, 8¼-inch, ₩ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10&30%
Cincinnati.....25&10%

Spoke Trimmers—
Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz.
Douglas'.....55&10%
Cincinnati.....₩ doz $9.00, 20% 25%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list. ..70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60@60&5%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50
Boardman's Britannia Spoons, case lots.....60
} 4 mos.

Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....
Nickel-Plated.....
} 75&10@80%, full cs. ex. 10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares.....25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibré Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized.
Fence Staples, Plain.
} Same price as B'rb Wire See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5&40%
Reversible Ratchet.....30%
Gardner.....25%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₩ ℔ 2½¢
Washita Stone, Extra.....₩ ℔ 19&20¢
Washita Stone, No. 1.....₩ ℔ 14&15¢
Washita Stone, No. 2.....₩ ℔ 10&11¢
Washita Slips, No. 1, Extra..₩ ℔ 36&38¢
Washita Slips, No. 1.....₩ ℔ 24&25¢
Arkansas Stone, No. 1, 4 to 6 in₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₩ ℔ 40¢
Turkey Slips.....₩ ℔ $1.00@1.50
Lake Superior, Chase.....₩ ℔ 16¢
Lake Superior Slips, Chase...₩ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₩ ℔ 18&20¢
Seneca Stone, High Rounds..₩ ℔ 20&25¢
Seneca Stone, Small Whets..₩ gro $24.00

Stove Polish—
Joseph Dixon's.....₩ gro $6.00,10%
Gem.....₩ gro $4.50, 10%
Gold Medal.....₩ gro $6.00, 25%
Mirror.....₩ pro $6.00, —%
Lustro.....₩ gro $4.75
Ruby.....₩ gro $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ $5.00
Boynton's Noon Day, ₩ gro.....13.00
Parlor Pride Stove Enamel..₩ gro $ cans
Yates' Liquid, 2 3 5 10 gal...8¢
₩ gal ...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₩ ℔ 15¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel....₩ gro $19.00
Bonnell's Liquid Stove Polish..₩ gro $9.00
Bonnell's Paste Stove Polish..₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00

Tacks, Brads, &c.—
List Oct. 19, 1889, extra 10&2 % cash.
Carpet Tacks—
American Iron, Blued.....70%
American Iron, Tinned or Cop'd...70%
Steel, Plain or Bright.....70%
Steel Tinned or Coppered.....70%
Swedes Iron, Blued.....70%
Swedes Iron, Tinned or Co'd.....70%
American Iron Cut Tacks.....67½%
Swedes Iron Upholst'rs' Tacks, S. S...70%
Swedes Iron Upholst'rs' Tacks, Tinned, S. S.....70%
Swedes Iron Card and Upholsterers' Tacks, Lanc.....66⅔%
Swedes Iron Card and Upholsterers' Tacks, Tinned, Lanc.....66⅔%
Gimp and Lace Tacks Lanc., Swedes Iron.....66⅔%
Gimp and Lace Tacks, Lanc., Swedes Iron, Tinned.....66⅔%
Gimp and Lace Tacks, S. S.....70%
Gimp and Lace Tacks Tinned, S. S..70%
Swedes Iron Basket or Trimmers' Tacks, Lanc.....66⅔%
Miners' Tacks, S. S.....70%
Bill-Posters' or Railroad Tacks, Lanc., Swedes.....66⅔%
Bill-Poster's' or Railroad Tacks, S.S..70%
Copper Tacks.....50%
Copper Finish. & Trunk Nails.....50%
Cigar Box Nails.....50%
Zinc Glaziers' Points.....50%
Picture-Frame Points.....50%
Looking-Glass Tacks.....50%
Brush Tacks.....50%
Tin-Capped Trunk Nails.....60%
Finishing Nails.....65%
Trunk & Clout Nails, Black & Tin'd.66⅔%
Common and Patent Brads.....60%
Hungarian Nails.....62½%
Basket and Chair Nails.....62½%
Leathered Carpet Tacks.....40%
Miscellaneous—
Double-Pointed.....82½%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&30%
Clark's.....33⅓&35%

Tapes, Measuring—
American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25&30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Pl'ced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co'.s ₩ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₩ doz., $24, 55&10%
Acme.....₩ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....35%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Jan. 1, 1887-
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70@70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₩ dos holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive.....₩ dz $2.50, 15%
Mouse, Bonanza.....₩ gr $10.00
Mouse Delusion.....₩ gr $15.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz, 90¢; in full cases, ₩ dos....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 2, ¼ and ½ ℔ Balls.....	22¢	30¢
No. 12, ¼ and ½ ℔ Balls.....	21¢	29¢
No. 18, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 24, ¼ and ½ ℔ Balls.....	18¢	28¢
No. 36, ¼ and ½ ℔ Balls.....	16¢	27¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.48@50¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....11½¢
3-Ply Hemp, 1 ℔ Balls.....12@12½¢
3-Ply Hemp, 1½ ℔ Balls.....11¢@11½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6½¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25&30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₩ dos $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—
Per ℔.....2¾¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ dos $11.00, 33⅓%
Penny's.₩ dos Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ dos $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Washers—

Size.....	⅛	5-16	⅜	½	⅝	¾	1
Washers....	6¼	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 4 ¢

Well Buckets, Galvanized—
See Trade Report.
Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₩ doz $4.00@.4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
Iron—See Trade Report.
Market,
Br. & Ann., Nos. 0 to 18.....65%
Cop'd, Nos. 0 to 18.....60%
Galv., Nos. 0 to 18.....55%
Tin'd, Tinned list Nos. 0 to 18.....55%
Stone,
Br. and Ann'd, Nos. 16 to 18....67½%
Bright and Ann'd, Nos. 19 to 26.67½&5%
Br. and Ann'd, Nos. 27 to 36....70&10%
Tinned.....67½%
Tinned Broom Wire.....67½@67½&5%
Galvanized Fence.....55%
Annealed Fence, Nos. 8 and 9.....65%
Annealed Grape, Nos. 10 to 14.....65%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin's Steel and Tin'd Wire on Spools, 50%
Malin's Brass and Cop. Wire on Spools 40%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 6, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₩ ℔
Picture Wire.....New list 50%
Barb Wire Safety Guards, ₩ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.
Painted Screen Cloth, good quality, ₩ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting.....70@70&10%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....25@30%
Iron, Galvanized.....30%
Cast Steel.....35%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&3%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co. 70&10%
Lamson & Sessions' Engineers'. 60&10%
Lamson & Sessions' Standard... 70&10%
Goes' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
Sterling Wrought.....
} 75&10@75 &10&5%
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....15&10%
Cincinnati Monkey Wrenches ...15&10%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886. 80&20&2&25%

CURRENT METAL PRICES.

JANUARY 15, 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :	
¾ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.....	₩ lb 2 00 @ ....¢
Refined Iron :	
¾ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1¼ in..... 4½ to 6 in. x ⅜ to 1 in.....	₩ lb 2.20 @ ....¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.40 @ ....¢
Rods—⅝ and 11-16 round and sq..	₩ lb 2.30 @ ....¢
Bands—1 to 6 x 5-16 to No. 12.....	₩ lb 2 50 @ ....¢
"Burden Best" Iron, base price..	₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price.....	₩ lb 2.80 @ ....¢
"Ulster".....	₩ lb 3.00 @ ....¢
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16.....	₩ lb 3.00	@ 3.00¢	3.50	@ .....¢
17 to 20	₩ lb 3.25	@ 3 25¢	3.50	@ 3.75 ¢
21 to 24.....	₩ lb 3.35	@ 3.35¢	3.75	@ .....¢
25 and 26.....	₩ lb 3 45	@	3.75	@ .....¢
27.....	₩ lb 3.55	@ 3.62½¢	4.00	@ .....¢
28.....	₩ lb 3.75	@ .. ..¢	4.25	@ .....¢

	B. B.		2d qual.
Galv'd, 14 to 20,	₩ lb, 5.00	@ ...	4.75½ @ .....¢
Galv'd, 21 to 24,	₩ lb, 5.37½	@ ...	5.12½ @ .....¢
Galv'd, 25 to 26,	₩ lb, 5.75	@ ...	5.50 @ .....¢
Galv'd, 27.....	₩ lb, 6.12½	@ ...	5.85½ @ .....¢
Galv'd, 28.....	₩ lb, 6.50	@ ...	6.23 @ ...¢
Patent Planished.....		₩ lb A 10¢	B, 9¢
Russia.....		₩ lb 9½¢	@ 10¢
American Cold Rolled B. B.....		₩ lb 5¢	@ 7¢
Craig Polished Sheet Steel.....		₩ lb,	8½¢

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 12 ¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d quality.....	₩ lb 14 ¢
3d quality.....	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	23 ¢
Straits, Pigs.....	23¼¢
English, Pigs.....	23 ¢
Straits in Bars.....	23¼¢

Tin Plates.

Charcoal Plates.—Bright.

			Per box.
Melyn Grade.....	IC, 10 x 14..	@	$6.50
" "	IC, 12 x 12..	@	6.75
" " ..	IC, 14 x 20..	@	6.50
" "	IC, 20 x 28..	@	13.00
" "	IX, 10 x 14..	@	8.00
" "	IX, 12 x 12..	@	8.25
" "	IX, 14 x 20..	@	8.00
" "	IX, 20 x 28..	@	15.75
" "	DC, 12½ x 17..	@	6.00
" "	DX, 12½ x 17..	@	7.50
Calland Grade.....	IC, 10 x 14..	@	6.50
" "	IC, 12 x 12..	@	6.75
" "	IC, 14 x 20..	@	6.40
" "	IX, 10 x 14 ..	@	7.65
" "	IX, 12 x 12..	@	7.90
" "	IX 14 x 20. ..	@	7.65
Allaway Grade.....	IC, 10 x 14..	@	5.60
" "	IC, 12 x 12..	@	5.75
" "	IC, 14 x 20..	@	5.60
" "	IC, 20 x 28..	@	11.00
" "	IX, 10 x 14..	@	6.75
" "	IX, 12 x 12..	@	6.90
" "	IX, 14 x 20..	@	6.75
" "	IX, 20 x 28..	@	13.50
" "	DC, 12½ x 17..	@	5.30
" " ..	DX, 12½ x 17.. 6 00	@	6.30

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	....	@	$5.12½
10 x 20..	....	@	7.25
20 x 28..	....	@	10.25
IX, 10 x 14, 14 x 20..	....	@	6.00
BV Grade.—IC, 10 x 14, 14 x 20..	....	@	4.87½

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20..	....	@	$5.10
20 x 28.....	...	@	10.25
IX, 14 x 20.....	....	@	5.90
20 x 28.....	....	@	11.80
Abecarne Grade.—IC, 14 x 20...	....	@	4.87½
20 x 28...	....	@	9.87½
IX, 14 x 20...	....	@	5.80
20 x 28...	....	@	11.60

Tin Boiler Plates.

IXX, 14 x 26.....112 sheets.....	$13 00	@ $13.00
IXX, 14 x 28..... 112 sheets....		@ 13 25
IXX, 14 x 31.....112 sheets		@ 14.75

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem

Ingot.

Lake	15½¢ @ 15¾¢
Baltimore Grade.....	@ 14¼¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	..
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	31	....	....	....	....
84	96		23	24	29	33	....	....	....	....
84		96	24	25	30	35	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

All Bath Tub Sheets..... 16 oz. 14 oz. 12 oz. 10 oz.
Per pound..... $0.25 0.27 0 29 0.32

Bolt Copper, ⅜ inch diameter and over, per pound..... 23¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	26¢
12 ounce and up to 14 ounce to square foot.....	27¢
10 ounce and up to 12 ounce.....	29¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....35¢. By the case...32¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅝	½	⅜	¼	⅛	1	1¼
8-14	6-12	37	33	30	29	28	27	24
15	13	38	33	31	30	29	28	25
16	14	39	34	32	31	30	29	25
17	15	40	35	33	30	31	30	26
18	16	42	36	34	32	31	30	27
19	17	43	37	35	34	33	32	29
20	18-19	44	39	37	36	35	34	31
21	20	46	41	39	38	37	36	34
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	39
24	23	53	46	44	43	41	40	41
25	24	56	49	46	45	44	43	45

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch.....	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch.....	$1.00
Plain, ⅛ inch.....	1.50
Fancy Tubing, Brass, to No. 20, inclusive.....	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list.....	25 @ ... %

Roll and Sheet Brass.

Discount from list. ..... 25 %

High Brass Rods.

Over 1 inch diameter..	27¢
¼ inch to 1 inch diameter, both inclusive.....	24¢
No. 8 and less than ¼ inch diameter.....	26¢
Smaller than No. 8.....	30¢
Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6¼¢
"Bergenport"	6¢
"Bertha"	6¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks.....	6¼¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4½¢
Newark	4½¢
Bar.....	4½¢
Pipe, subject to trade discount.....	6 ¢
Tin-Lined Pipe, subject to trade discount.....	15¢
Block Tin Pipes, subject to trade discount.....	45¢
Sheet, subject to trade discount.....	6¾¢

Shot.

Eastern prices 2¢ off, cash, 5 days.

Drop, ₩ 25-lb bag	$1 19
Drop, ₩ 5-lb bag.....	.29
Chilled and Buck, ₩ 25-lb bag.....	1.44
Chilled and Buck, ₩ 5-lb bag.....	34
Dust, ₩ bag.....	1.80

Solder.

½ @ ½ (Guaranteed).....	14¾¢
Extra Wiping	12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson.....	₩ lb 81¢
Hallett's.....	" 25 ¢

Fittings.

Cast Iron Fittings, Black and Galvanized.....	75 %
Cast Iron Fittings, Bushings & Plugs.....	75&10@75&10&5 %
Cast Iron Fittings, Flanges.....	75 %
Malleable Iron Bushings.....	75&10@75&10&5 %
Malleable Iron Unions.....	70 %
Malleable Iron American Unions.....	55 %
Malleable Iron Unions, Keystone.....	55 %
Wrought-Iron Nipples.....	75&5@75&10 %
Wrought-Iron Couplings.....	70 %
Wrought-Iron Long Screws.....	70@70&5 %
Casing Fittings.....	60 %
Malleable Iron Fittings.....	40 %

Valves, Cocks, &c.

Iron Body Valves.....	70 %
Throttle Valves, Iron Body.....	70 %
All-Iron Valves.....	65 %
Compression Gauge Cocks.....	60 %
Mississippi Gauge Cocks.....	60 %
Register Gauge Cocks.....	65@65&10 %
Air Cocks and Radiator Air Cocks.....	65@65&10 %
Steam Gauge Cocks.....	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle.....	65@65&10 %
Globe Oil Cups.....	55 %
Common Lubricators.....	65@65&10 %
Lubricators with Air Cocks.....	65@65&10 %
Iron Body Lubricators.....	60 %
Steam Whistles.....	65 %
Whistle Valves	65 %
Water Gauges.....	65 %
Brass Expansion Joints.....	55 %
Pump Valves.....	55 %
Soldering Unions.....	65 %
Soldering Nipples.....	70 %
Brass Unions (Union Joints).....	65 %
Radiator Nipples.....	6 %
Fusible Plugs.....	60 %
Oil Pumps.....	55 %
Self-Acting Air Valves.....	65 %
Vacuum Valves.....	55 %
Steam Swing Joints.....	55 %
Iron Strainers.....	55&10 %
Jenkins' Iron Valves, except Gate Valves.....	60&10 %
Jenkins' All-Iron Valves, except Gate Valves.....	60 %
Jenkins' Iron Body Gate Valves.....	55 %
Jenkins' All-Iron Gate Valves	55 %
Iron Cocks, all Iron.....	65 %
Iron Cocks, with Brass Plugs.....	65 %
Brass Globe, Angle and Cross Valves.....	65 %
Brass Globe Valves, Finished.....	45 %
Brass Globe and Angle Valves, hose outlet.....	65 %
Brass Garden Hose Valves.....	65 %
Brass Caps for Hose Valves.....	60 %
Brass Horizontal, Vertical and Angle Check Valves.....	65 %
Brass Safety Valves.....	65 %
Brass Safety Valves, low pressure.....	65 %
Brass Safety Valves, low pressure, with balance weight.....	65 %
Brass Butterfly Valves.....	55 %
Brass Throttle Valves.....	55 %
Brass Radiator Valves.....	65 %
Brass Radiator Valves, Jenkins'.....	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves.....	65 %
Brass Jenkins' Gate Valves.....	50 %
Brass Steam Cocks.....	60 %
Brass Gas, Meter and Union Meter Cocks.....	60 %
Brass Fittings, Rough.....	60 %
Brass Fittings, Finished.....	25 %
Brass Bushings.....	60

Plumbers' Brass Work.

Ground Key Work, Rough.....	60 %
Ground Key Work, Finished.....	55 %
Compression Work.....	60@60&5 %
Compression Work, Grundy, Heavy Pattern.....	55 %
Chain Stays.....	60 %
Basin Plugs.....	60 %
Sink or Bath and Wash Tray Plugs.....	60 %
Basin Clamps.....	55 %

PAINTS, OILS AND COLORS.

Animal and Vegetable Oils.

Linseed, City, raw.....per gal	60	@	62
" " boiled.....	63	@	65
" Western, raw.....	59	@	60
Lard, City, Extra Winter.....	55	@	56
" " Prime, present make.....	..	@	54
" " Extra No. 1.....	45	@	48
" " No. 1.....	38	@	42
" Western, prime.....	53	@	54
Cotton-seed, Crude, prime.....	..	@	27
" " off grades.....	26	@	..
" Summer Yellow, prime....	33	@	34
" " off grades.	32	@	33
Sperm, Crude.....	..	@	70
" Natural Spring.....	..	@	..
" Bleached Spring.....	..	@	..
" Natural Winter.....	78	@	80
" Bleached Winter.....	83	@	85
Whale, Crude.....	40	@	..
" Natural Winter.....	46	@	..
" Bleached Winter.....	48	@	..
" Extra Bleached.....	51	@	..
Sea Elephant, Bleached Winter.....	58	@	60
Menhaden, Crude, Sound.....	22	@	23
" Crude, Southern.....	..	@	..
" Light Pressed.....	27	@	28
" Bleached Winter.....	32	@	33
" Extra Bleached	36	@	..